ARMSTRONG

CATALOG C-39

ARMSTRONG BROS. TOOL CO.
"THE TOOL HOLDER PEOPLE"
CHICAGO, U.S.A.

1938

Ready Reference

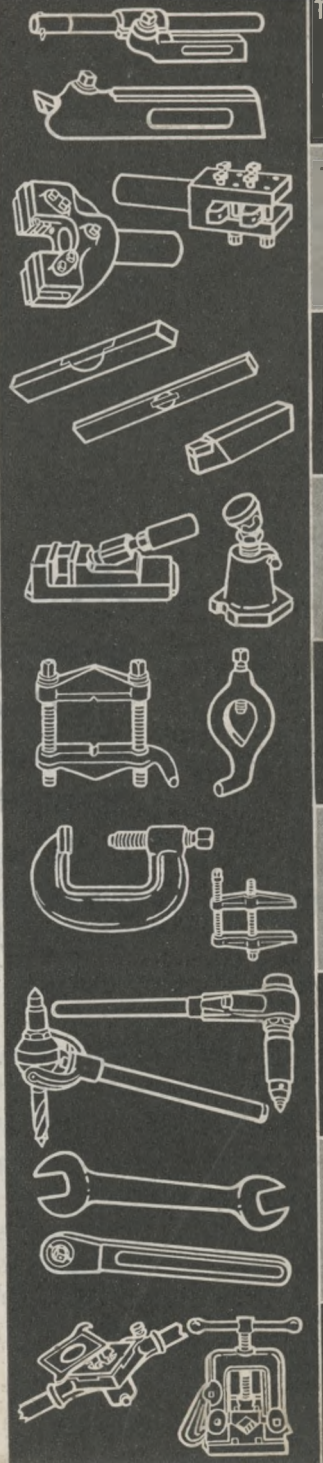
INDEX by SECTIONS

How to Use Section Index

With thumb directly below the square of section wanted, bend catalogue sharply. The section marker will appear on the edge of the book.

NOTE: A complete alphabetical cross index will be found on pages 225 to 229.

An explanation of the Armstrong System of Tool Holders (the cutting tools used in over 96% of the machine shops and tool rooms) is given on pages 8-9.



ARMSTRONG TOOLS are carried by all leading supply houses . . . they are identified by the Arm-and-Hammer Trade Mark — your guarantee of the highest quality.

ARMSTRONG BROS. TOOL CO.

MANUFACTURERS OF

TOOL HOLDERS

For Turning, Boring, Threading, Knurling, Cutting off, Planing, Slotting and Drilling Metals

PIPE TOOLS

Dies, Stocks, Vises, Cutters, Pipe Wrenches, Chain Tongs, Etc.

DROP FORGED CLAMPS

Light, Medium and Heavy Duty

WRENCHES

Drop Forged Carbon and Alloy Steel, Detachable Sockets, Handles, Etc.

LATHE DOGS, RATCHET DRILLS, DRILLING POSTS, EYE BOLTS, STAR DRILLS, DRILL DRIFTS, DRILL VISES, PLANER JACKS AND OTHER MACHINE SHOP SPECIALTIES

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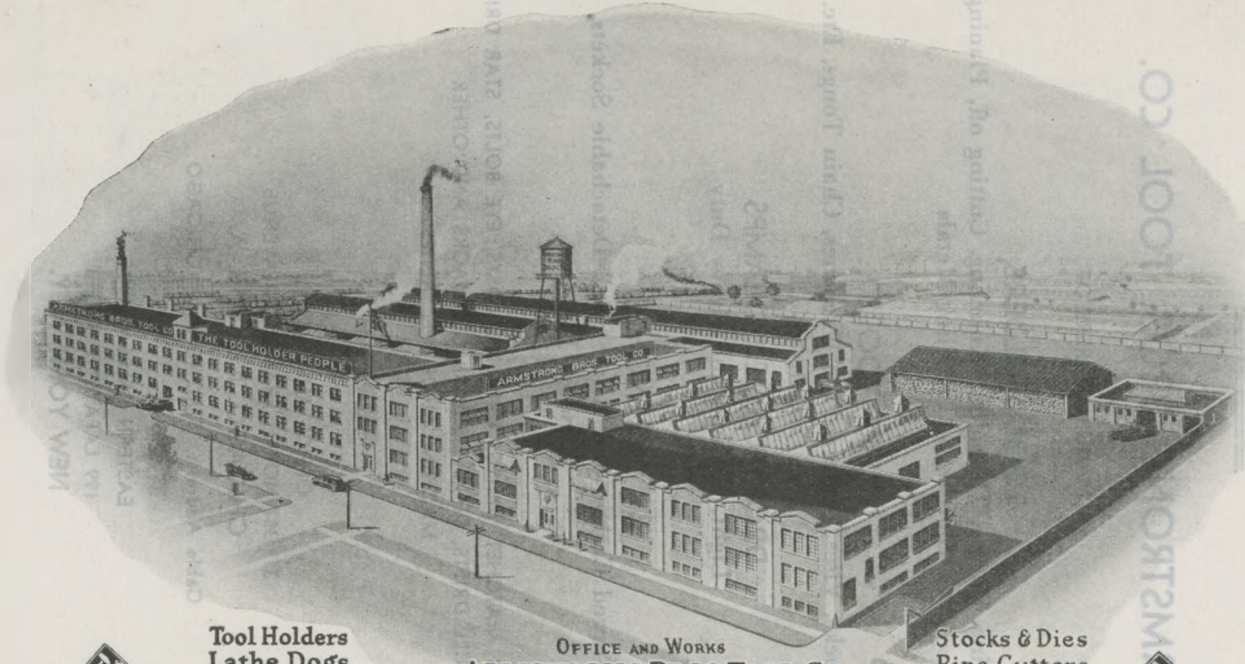


TRADE MARK

Tool Holders
Lathe Dogs
Clamps
Ratchet Drills
Drop Forged Wrenches
Socket Wrenches

OFFICE AND WORKS

ARMSTRONG BROS TOOL CO.

"The Tool Holder People"

317-357 N. Francisco Avenue

Chicago, U.S.A.

Stocks & Dies
Pipe Cutters
Pipe Vises
Chain Tongs
Pipe Wrenches
Receding Threaders

TRADE MARK

GRAND PRIZE WINNERS

Armstrong Tools have won highest honors at every great exposition entered, from the Universal Exposition at Paris in 1900 to the present day—thus confirming the favorable judgment of practical machinists based upon many years satisfactory service.

Universal Exposition
Paris, 1900
Two Bronze Medals
Highest Award

World's Fair
St. Louis, 1904
Gold Medal
Highest Award

GRAND PRIZE

MEDAL OF HONOR

Panama-Pacific International
Exposition, San Francisco
1915
The Two Highest Awards
Conferred

Universal Exposition
Liege, 1905
Bronze Medal
Highest Award

Franklin Institute
Medal of Merit

Trade Mark
ARMSTRONG
Reg. in U. S. Pat. Off.

ARMSTRONG PATENTS

Feb.	28, 1893	April	14, 1903	July	10, 1917
March	12, 1895	Dec.	1, 1903	Oct.	9, 1917
April	19, 1898	Jan.	10, 1905	Jan.	1, 1918
Nov.	8, 1898	March	6, 1906	Sept.	3, 1918
Jan.	10, 1899	June	16, 1908	June	15, 1920
Nov.	14, 1899	Nov.	10, 1908	May	27, 1924
August	28, 1900	March	2, 1909	May	11, 1926
Sept.	25, 1900	Oct.	19, 1909	Jan.	4, 1927
Jan.	29, 1901	June	7, 1910	March	15, 1927
May	28, 1901	April	30, 1912	Dec.	20, 1927
March	25, 1902	July	8, 1913	July	3, 1928
May	27, 1902	July	14, 1914	Oct.	22, 1929
August	19, 1902	Sept.	5, 1916	July	16, 1935
March	3, 1903	Feb.	6, 1917	April	27, 1937

Other Patents Applied for

PLEASE NOTE

This catalog C-39 supersedes all previous editions which are hereby withdrawn. Prices are subject to change without notice.

WHEN ORDERING specify our catalog numbers.

TERMS CASH—Payable in Chicago par funds. Unless otherwise specified all quotations are based upon delivery free on board cars at Chicago and our responsibility ceases when such delivery is effected.

DEALERS' CATALOGS—Cuts will be furnished free to dealers for use in their catalogs and, if desired, we will aid in preparing copy and correcting proofs; we do not pay for catalog space.

PRINTED MATTER FURNISHED DEALERS—We will furnish a reasonable supply of printed matter free to Dealers who stock Armstrong Tools.

WEIGHTS—The weights listed are approximate only and are for convenience in estimating weight of shipments.

DIMENSIONS—All dimensions are shown in inches unless otherwise stated.

GUARANTEE—Every Armstrong Tool is guaranteed against defective material and workmanship.

ARMSTRONG TOOL HOLDERS

A Complete, Economical and Efficient System of High Speed Lathe and Planer Tools

Heavy loss in time and material is inseparable from the use of forged lathe and planer tools, and this loss has been proportionately increased rather than reduced by the almost universal use of High Speed Steel which has greatly increased the "dead investment" in heavy forged tools, which in many cases are required for occasional use only, while the steel wasted in "stub ends," forging and grinding figures a loss many times greater than was formerly the case with forged tools made of carbon tool steel.

Moreover, the time saved by Armstrong Tool Holders is twice as valuable as it was some years ago. As a result, the saving in time, steel and annoyance effected by Armstrong Tool Holders can hardly be overestimated. They save all forging and most of the grinding as well as much time lost by men going to the tool dresser while their machines stand idle. No stock of heavy tool steel need be carried, and points of various shapes can be kept on the lathe or in the tool room ready for instant use.

Most managers, purchasing agents and practical machinists are recognizing these facts and the many advantages of the Armstrong System, the only system of Tool Holders which is a proved success under widely varying conditions and under the hardest of all tests, nearly fifty years of hard, practical use in the World's Machine Shops.

The holders are designed and proportioned on lines which our many years of experience and close study in this, our special field of work, have shown to be correct; they are drop forged from a special steel which combines stiffness and strength to a remarkable degree and are accurately machined, heat treated and hardened.

The set screws are made of treated alloy steel with hardened point and are practically unbreakable.

The cutters for Armstrong Tool Holders are of stock sizes and shapes which are readily obtainable, thus enabling the user to make his cutters from any steel he may prefer, and leaving him independent in choosing his source of supply.

For plants using the Gisholt-Taylor system of tool grinding, we furnish a Grinding Chart for Armstrong Cutters.

The Armstrong Tool Holder System includes tool holders for every operation on the lathe, planer, shaper, slotter, turret lathe, etc., with over one hundred modifications of shape and size, all embodying the same economical and mechanical principle of an inserted cutter in a permanent supporting shank or holder, and adapted to all classes of work from the lightest to the heaviest.

This point is of great importance, as the adoption of even the most economical system of tools is of little practical value to a large concern if its application be limited to a few machines of small size.

When you decide to adopt the Armstrong System, don't stop when you have equipped a few of your small lathes or you will fail to reap the full advantage or to realize fully the economy, convenience and efficiency which a complete equipment will demonstrate.

Remember, that for heavy duty we furnish proportionately larger and stronger tool holders and cutters, and the Armstrong principle is just as efficient and economical in the large tools as in the smaller sizes.

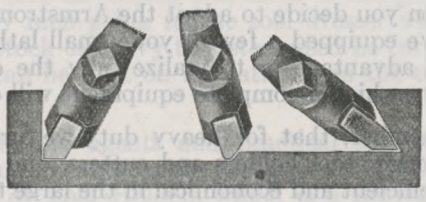
We insist that it is the height of wasteful inefficiency to tie up capital in solid high speed tools when less than one-tenth the amount of steel, if used in Armstrong Tool Holders, will do the work and save time and grinding wheels as well.

Adopt the Armstrong System—Do it at once.

ONE ARMSTRONG TOOL HOLDER

with a few cutters which can be quickly and cheaply made from the bar by any machinist will do any job on the lathe or shaper; roughing, facing, finishing, corner and fillet work.

Effectively Equals a Dozen Forged Tools



Saves All Forging

Makes One Pound of High Speed Tool Steel Equal 10 Pounds in Forged Tools

ARMSTRONG TOOL HOLDERS

Patented

Straight Shank

Each Tool is boxed separately and price includes Wrench and one High Speed Cutter Bit.

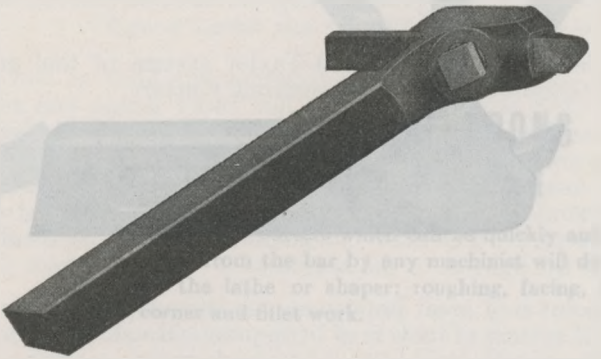
No.	Size of Holder	Size of Cutter Square	Approx. Weight Each Pounds	Extra Cutter Bits High Speed Each	Price Each Complete	No.
000-S	5/16 x 1/2 x 4	3/16	1/2	$0.15	$ 2.70	000-S
00-S	5/16 x 3/4 x 4 1/2	3/16	1/2	.15	2.70	00-S
0-S	3/8 x 7/8 x 5	1/4	3/4	.20	2.85	0-S
1-S	1/2 x 1 1/8 x 6	5/16	1 1/2	.35	3.25	1-S
2-S	5/8 x 1 3/8 x 7	3/8	2 1/4	.55	4.00	2-S
3-S	3/4 x 1 5/8 x 8	7/16	3 1/2	.90	5.40	3-S
4-S	7/8 x 1 3/4 x 9	1/2	4 3/4	1.30	6.90	4-S
5-S	1 x 2 x 11	5/8	7 1/2	2.35	9.75	5-S
6-S	1 1/4 x 2 1/4 x 13	3/4	12	3.85	13.50	6-S
7-S	1 1/2 x 2 1/2 x 16	7/8	19	5.85	22.50	7-S
750-S	1 5/8 x 2 3/4 x 18	1	26	8.35	33.00	750-S
800-S	1 3/4 x 3 x 20	1 1/8	32	11.35	42.75	800-S

For different forms of finished cutters and price list of same, see page 62.

ARMSTRONG TOOL HOLDERS

Patented

Left Hand Off-Set



Each Tool is boxed separately and price includes Wrench and one High Speed Cutter Bit.

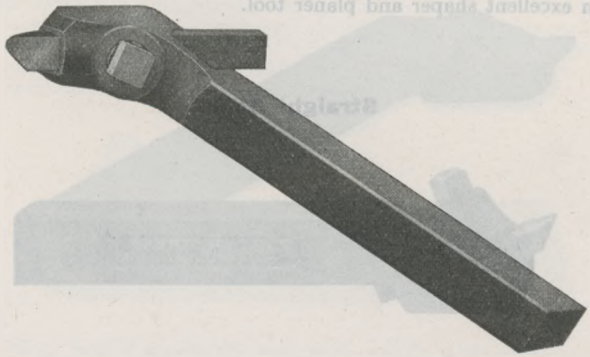
No.	Size of Holder	Size of Cutter Square	Approx. Weight Each Pounds	Extra Cutter Bits High Speed Each	Price Each Complete	No.
000-L	5/16 x 1/2 x 4	3/16	1/2	$0.15	$ 2.70	000-L
00-L	5/16 x 3/4 x 4 1/2	3/16	1/2	.15	2.70	00-L
0-L	3/8 x 7/8 x 5	1/4	3/4	.20	2.85	0-L
1-L	1/2 x 1 1/8 x 6	5/16	1 1/2	.35	3.25	1-L
2-L	5/8 x 1 3/8 x 7	3/8	2 1/4	.55	4.00	2-L
3-L	3/4 x 1 5/8 x 8	7/16	3 3/4	.90	5.40	3-L
4-L	7/8 x 1 3/4 x 9	1/2	5	1.30	6.90	4-L
5-L	1 x 2 x 11	5/8	8	2.35	9.75	5-L
6-L	1 1/4 x 2 1/4 x 13	3/4	13	3.85	13.50	6-L
7-L	1 1/2 x 2 1/2 x 16	7/8	21	5.85	22.50	7-L
750-L	1 5/8 x 2 3/4 x 18	1	30	8.35	33.00	750-L
800-L	1 3/4 x 3 x 20	1 1/8	35	11.35	42.75	800-L

For different forms of finished cutters and price list of same, see page 62.

ARMSTRONG TOOL HOLDERS

Patented

Right Hand Off-Set



Each Tool is boxed separately and price includes Wrench and one High Speed Cutter Bit.

No.	Size of Holder	Size of Cutter Square	Approx. Weight Each Pounds	Extra Cutter Bits High Speed Each	Price Each Complete	No.
000-R	5/16 x 1/2 x 4	3/16	1/2	$0.15	$ 2.70	000-R
00-R	5/16 x 3/4 x 4 1/2	3/16	1/2	.15	2.70	00-R
0-R	3/8 x 7/8 x 5	1/4	3/4	.20	2.85	0-R
1-R	1/2 x 1 1/8 x 6	5/16	1 1/2	.35	3.25	1-R
2-R	5/8 x 1 3/8 x 7	3/8	2 1/4	.55	4.00	2-R
3-R	3/4 x 1 5/8 x 8	7/16	3 3/4	.90	5.40	3-R
4-R	7/8 x 1 3/4 x 9	1/2	5	1.30	6.90	4-R
5-R	1 x 2 x 11	5/8	8	2.35	9.75	5-R
6-R	1 1/4 x 2 1/4 x 13	3/4	13	3.85	13.50	6-R
7-R	1 1/2 x 2 1/2 x 16	7/8	21	5.85	22.50	7-R
750-R	1 5/8 x 2 3/4 x 18	1	30	8.35	33.00	750-R
800-R	1 3/4 x 3 x 20	1 1/8	35	11.35	42.75	800-R

For different forms of finished cutters and price list of same, see page 62.

ARMSTRONG DROP-HEAD TOOL HOLDERS

Patented

Designed especially for use on lathes of British and European make having clamp tool rest, and American lathes of similar design with high slide rest or low centers. The head and screw are extra heavy and the "goose neck" shape of holder makes it an excellent shaper and planer tool.

Straight Shank

Each Tool is boxed separately and price includes Wrench and one High Speed Cutter Bit.

No.	Size of Holder	Size of Cutter Square	Height from Bottom of Shank to Cutter Point	Approx. Weight Each Pounds	Extra Cutter Bits High Speed Each	Price Each Complete	No.
100-S	½x ⅝x 6	3/16	9/16	¾	$0.15	$2.70	100-S
101-S	⅝x ¾x 7½	¼	11/16	1¼	.20	2.85	101-S
201-S	¾x ⅞x 8½	5/16	13/16	2	.35	3.25	201-S
102-S	⅞x1 x 9½	⅜	15/16	3	.55	4.00	102-S
301-S	1 x1⅛x10½	7/16	1 1/16	4¼	.90	5.40	301-S
103-S	1⅛x1¼x11½	½	1 3/16	6	1.30	6.90	103-S
104-S	1⅜x1½x13½	⅝	1 5/16	10	2.35	9.75	104-S
105-S	1⅝x1¾x15½	¾	1½	16	3.85	13.50	105-S
106-S	1⅞x2 x17½	⅞	1¾	23	5.85	22.50	106-S
107-S	2⅛x2¼x19½	1	2	31	8.35	33.00	107-S

For different forms of finished cutters and price list of same, see page 62.

ARMSTRONG DROP-HEAD TOOL HOLDERS

Patented

Left Hand Off-Set

Each Tool is boxed separately and price includes Wrench and one High Speed Cutter Bit.

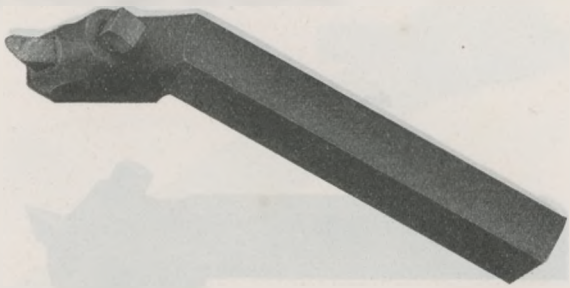
No.	Size of Holder	Size of Cutter Square	Height from Bottom of Shank to Cutter Point	Approx. Weight Each Pounds	Extra Cutter Bits High Speed Each	Price Each Complete	No.
100-L	½x 5/8x 6	3/16	9/16	3/4	$0.15	$ 2.70	100-L
101-L	5/8x 3/4x 7½	1/4	11/16	1¼	.20	2.85	101-L
201-L	3/4x 7/8x 8½	5/16	13/16	2	.35	3.25	201-L
102-L	7/8x1 x 9½	3/8	15/16	3	.55	4.00	102-L
301-L	1 x1⅛x10½	7/16	1 1/16	4¼	.90	5.40	301-L
103-L	1⅛x1¼x11½	½	1 3/16	6	1.30	6.90	103-L
104-L	1⅜x1½x13½	5/8	1 5/16	10	2.35	9.75	104-L
105-L	1⅝x1¾x15½	3/4	1½	16	3.85	13.50	105-L
106-L	1⅞x2 x17½	7/8	1¾	23	5.85	22.50	106-L
107-L	2⅛x2¼x19½	1	2	31	8.35	33.00	107-L

For different forms of finished cutters and price list of same, see page 62.

ARMSTRONG DROP-HEAD TOOL HOLDERS

Patented

Right Hand Off-Set



Each Tool is boxed separately and price includes Wrench and one High Speed Cutter Bit.

No.	Size of Holder	Size of Cutter Square	Height from Bottom of Shank to Cutter Point	Approx. Weight Each Pounds	Extra Cutter Bits High Speed Each	Price Each Complete	No.
100-R	½x ⅝x 6	3/16	9/16	¾	$0.15	$ 2.70	100-R
101-R	⅝x ¾x 7½	¼	11/16	1¼	.20	2.85	101-R
201-R	¾x ⅞x 8½	5/16	13/16	2	.35	3.25	201-R
102-R	⅞x1 x 9½	⅜	15/16	3	.55	4.00	102-R
301-R	1 x1⅛x10½	7/16	1 1/16	4¼	.90	5.40	301-R
103-R	1⅛x1¼x11½	½	1⅜16	6	1.30	6.90	103-R
104-R	1⅜x1½x13½	5/8	1⅝16	10	2.35	9.75	104-R
105-R	1⅝x1¾x15½	¾	1½	16	3.85	13.50	105-R
106-R	1⅞x2 x17½	⅞	1¾	23	5.85	22.50	106-R
107-R	2⅛x2¼x19½	1	2	31	8.35	33.00	107-R

For different forms of finished cutters and price list of same, see page 62.

ARMSTRONG-STELLITE TOOL HOLDERS

Patented

Straight Shank

This Tool Holder is designed especially for the use of "Stellite" cutters, extra hard High Speed Steel or any alloy metal of such nature as to require large clamping surface, which is obtained by means of a heavy tool steel gib movably set between the cutter and screw point. This feature is combined with the usual Armstrong qualities of great strength and compactness.

Each Tool is boxed separately and is furnished without Cutter. Wrench is included.

No.	Size of Holder	Size of Cutter Square	Length of Cutter	Approx. Weight Each Pounds	Stellite J-Metal Cutter Bits Price Each	Price Each	No.
X 0-S	3/8 x 7/8 x 6	1/4	2 1/8	1 1/4	$1.05	$5.30	X 0-S
X 1-S	1/2 x 1 1/4 x 7	5/16	2 1/2	1 3/4	1.65	6.15	X 1-S
X 2-S	5/8 x 1 3/8 x 8	3/8	3	3	2.40	7.30	X 2-S
X 3-S	3/4 x 1 5/8 x 9	7/16	3 1/2	4 1/2	3.50	9.75	X 3-S
X 4-S	7/8 x 1 3/4 x 10	1/2	4	6 1/2	5.00	13.45	X 4-S
X 5-S	1 x 2 x 12	5/8	4 1/2	10	8.20	17.85	X 5-S

STELLITE

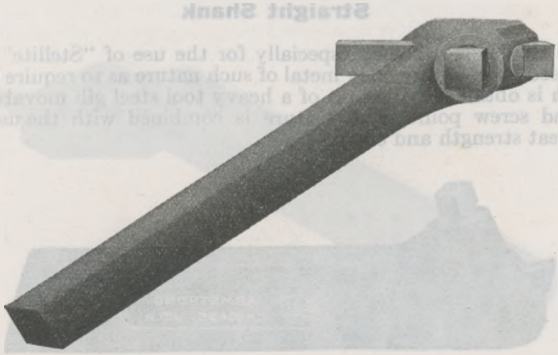
Stellite J-Metal is not steel, but a mixture of semi-rare metals. It is more brittle than High Speed Steel and therefore should be ground so as to give as much support under the cutting edge as possible.

In a cast metal, the best cutting properties are found in the "drag" end, or that part opposite the "gate" end. In Stellite, the "gate" ends are notched so that they will not be used as the cutting edge.

ARMSTRONG-STELLITE TOOL HOLDERS

Patented

Left Hand Off-Set



Each Tool is boxed separately and is furnished without Cutter. Wrench is included.

No.	Size of Holder	Size of Cutter Square	Length of Cutter	Approx. Weight Each Pounds	Stellite J-Metal Cutter Bits Price Each	Price Each	No.
X 0-L	⅜ x ⅞ x 6	¼	2⅛	1¼	$1.05	$5.30	X 0-L
X 1-L	½ x 1⅛ x 7	5/16	2½	1¾	1.65	6.15	X 1-L
X 2-L	⅝ x 1⅜ x 8	⅜	3	3	2.40	7.30	X 2-L
X 3-L	¾ x 1⅝ x 9	7/16	3½	4½	3.50	9.75	X 3-L
X 4-L	⅞ x 1¾ x 10	½	4	6½	5.00	13.45	X 4-L
X 5-L	1 x 2 x 12	⅝	4½	10	8.20	17.85	X 5-L

DIRECTIONS FOR GRINDING STELLITE CUTTERS

Stellite J-Metal is a cast metal.

Like all castings the exterior surface of Stellite is hardest; therefore, do not grind into the cutter any deeper than is necessary.

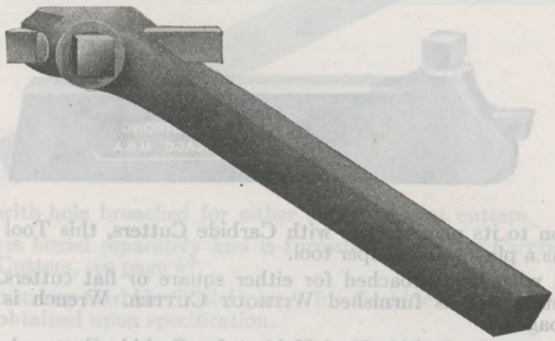
In regrinding the cutter, remove just enough metal to form the proper cutting edge.

After grinding, remove the wire edge with an oil stone, to prevent flaking.

ARMSTRONG-STELLITE TOOL HOLDERS

Patented

Right Hand Off-Set



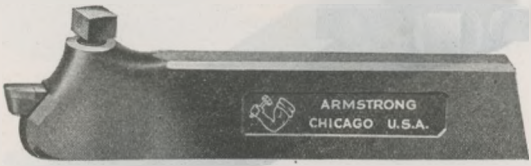
Each Tool is boxed separately and is furnished without Cutter. Wrench is included.

No.	Size of Holder	Size of Cutter Square	Length of Cutter	Approx. Weight Each Pounds	Stellite J-Metal Cutter Bits Price Each	Price Each	No.
X 0-R	⅜ x ⅞ x 6	¼	2⅛	1¼	$1.05	$5.30	X 0-R
X 1-R	½ x 1⅛ x 7	5/16	2½	1¾	1.65	6.15	X 1-R
X 2-R	⅝ x 1⅜ x 8	⅜	3	3	2.40	7.30	X 2-R
X 3-R	¾ x 1⅝ x 9	7/16	3½	4½	3.50	9.75	X 3-R
X 4-R	⅞ x 1¾ x 10	½	4	6½	5.00	13.45	X 4-R
X 5-R	1 x 2 x 12	⅝	4½	10	8.20	17.85	X 5-R

ARMSTRONG CARBIDE TOOL HOLDERS

Straight Shank

In this Tool Holder, the cutter is held parallel to the shank of the holder which permits grinding the cutter so as to give maximum support to the cutting edge. This feature, together with the great rigidity of Armstrong Tool Holders, is recognized by Carbide Engineers as a prerequisite to the successful application of Carbide Cutters.



In addition to its primary use with Carbide Cutters, this Tool Holder is also widely used as a planer and shaper tool.

Furnished with hole broached for either square or flat cutters. Each Tool is boxed separately and is furnished WITHOUT CUTTER. Wrench is included. For Cutters, see page 67.

Special Armstrong Carbide Tool Holders for Carbide Cutters larger than sizes listed may be obtained upon specification.

FOR SQUARE CUTTERS

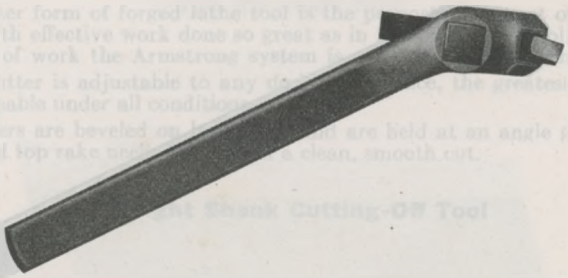
No.	Size of Holder	Size Cutter	Approx. Weight Each Lbs.	Price Each	No.
T-0-S	3/8 x 15/16 x 6	1/4 sq.	1 1/4	$ 3.20	T-0-S
T-1-S	1/2 x 1 1/4 x 7	5/16 sq.	2	3.60	T-1-S
T-2-S	5/8 x 1 1/2 x 8	3/8 sq.	3 1/4	4.50	T-2-S
T-3-S	3/4 x 1 3/4 x 9	7/16 sq.	5	6.00	T-3-S
T-4-S	7/8 x 1 7/8 x 10	1/2 sq.	7	7.60	T-4-S
T-5-S	1 x 2 1/8 x 12	5/8 sq.	10 1/2	10.80	T-5-S

FOR FLAT CUTTERS

FT-0-S	3/8 x 15/16 x 6	1/4 x 3/8	1 1/4	$ 3.80	FT-0-S
FT-1-S	1/2 x 1 1/4 x 7	5/16 x 7/16	2	4.40	FT-1-S
FT-2-S	5/8 x 1 1/2 x 8	3/8 x 1/2	3 1/4	5.40	FT-2-S
FT-3-S	3/4 x 1 3/4 x 9	7/16 x 9/16	5	7.20	FT-3-S
FT-4-S	7/8 x 1 7/8 x 10	1/2 x 3/4	7	9.20	FT-4-S
FT-5-S	1 x 2 1/8 x 12	5/8 x 7/8	10 1/2	12.90	FT-5-S

ARMSTRONG CARBIDE TOOL HOLDERS

Left Hand Off Set



Furnished with hole broached for either square or flat cutters.

Each Tool is boxed separately and is furnished WITHOUT CUTTER. Wrench is included. For Cutters, see page 67.

Special Armstrong Carbide Tool Holders for Carbide Cutters larger than sizes listed may be obtained upon specification.

FOR SQUARE CUTTERS

No.	Size of Holder	Size Cutter	Approx. Weight Each Lbs.	Price Each	No.
T-0-L	3/8 x 15/16 x 6	1/4 sq.	1 1/4	$ 3.20	T-0-L
T-1-L	1/2 x 1 1/4 x 7	5/16 sq.	2	3.60	T-1-L
T-2-L	5/8 x 1 1/2 x 8	3/8 sq.	3 1/4	4.50	T-2-L
T-3-L	3/4 x 1 3/4 x 9	7/16 sq.	5	6.00	T-3-L
T-4-L	7/8 x 1 7/8 x 10	1/2 sq.	7	7.60	T-4-L
T-5-L	1 x 2 1/8 x 12	5/8 sq.	10 1/2	10.80	T-5-L

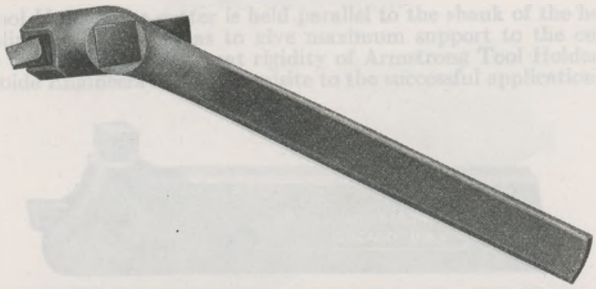
FOR FLAT CUTTERS

FT-0-L	3/8 x 15/16 x 6	1/4 x 3/8	1 1/4	$ 3.80	FT-0-L
FT-1-L	1/2 x 1 1/4 x 7	5/16 x 7/16	2	4.40	FT-1-L
FT-2-L	5/8 x 1 1/2 x 8	3/8 x 1/2	3 1/4	5.40	FT-2-L
FT-3-L	3/4 x 1 3/4 x 9	7/16 x 9/16	5	7.20	FT-3-L
FT-4-L	7/8 x 1 7/8 x 10	1/2 x 3/4	7	9.20	FT-4-L
FT-5-L	1 x 2 1/8 x 12	5/8 x 7/8	10 1/2	12.90	FT-5-L

Right Hand Offset shown page 22.

ARMSTRONG CARBIDE TOOL HOLDERS

Right Hand Off-Set



Furnished with hole broached for either square or flat cutters.

Each Tool is boxed separately and is furnished WITHOUT CUTTER. Wrench is included. For Cutters, see page 67.

Special Armstrong Carbide Tool Holders for Carbide Cutters larger than sizes listed may be obtained upon specification.

FOR SQUARE CUTTERS

No.	Size of Holder	Size Cutter	Approx. Weight Each Lbs.	Price Each	No.
T-0-R	3/8 x 15/16 x 6	1/4 sq.	1 1/4	$ 3.20	T-0-R
T-1-R	1/2 x 1 1/4 x 7	5/16 sq.	2	3.60	T-1-R
T-2-R	5/8 x 1 1/2 x 8	3/8 sq.	3 1/4	4.50	T-2-R
T-3-R	3/4 x 1 3/4 x 9	7/16 sq.	5	6.00	T-3-R
T-4-R	7/8 x 1 7/8 x 10	1/2 sq.	7	7.60	T-4-R
T-5-R	1 x 2 1/8 x 12	5/8 sq.	10 1/2	10.80	T-5-R

FOR FLAT CUTTERS

FT-0-R	3/8 x 15/16 x 6	1/4 x 3/8	1 1/4	$ 3.80	FT-0-R
FT-1-R	1/2 x 1 1/4 x 7	5/16 x 7/16	2	4.40	FT-1-R
FT-2-R	5/8 x 1 1/2 x 8	3/8 x 1/2	3 1/4	5.40	FT-2-R
FT-3-R	3/4 x 1 3/4 x 9	7/16 x 9/16	5	7.20	FT-3-R
FT-4-R	7/8 x 1 7/8 x 10	1/2 x 3/4	7	9.20	FT-4-R
FT-5-R	1 x 2 1/8 x 12	5/8 x 7/8	10 1/2	12.90	FT-5-R

ARMSTRONG CUTTING-OFF TOOLS

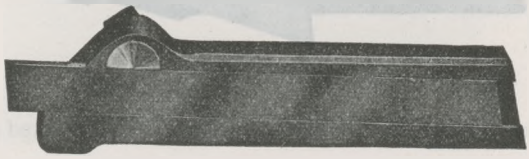
Patented

In no other form of forged lathe tool is the proportionate cost of maintenance compared with effective work done so great as in the cutting-off tool; consequently in this class of work the Armstrong system is especially effective and economical.

As the cutter is adjustable to any desired clearance, the greatest possible support is obtainable under all conditions.

The cutters are beveled on both sides and are held at an angle giving the side clearance and top rake needed to obtain a clean, smooth cut.

Straight Shank Cutting-Off Tool



Each Tool is boxed separately and price includes Wrench and one High Speed Cutter.

Approximate sizes of Cutters are shown; actual sizes are slightly less. When ordering extra Cutters, please specify size and tool number.

No.	Size of Shank	Size of Cutter	Approx. Weight Each Pounds	Extra Cutter Blades, High Speed, Finished Each	Price Each Complete	No.
19	5/16 x 3/4 x 4 1/2	3/32 x 1/2	1/2	$0.60	$2.85	19
20	3/8 x 7/8 x 5	3/32 x 5/8	3/4	.65	3.00	20
21	1/2 x 1 1/8 x 6	1/8 x 3/4	1 1/4	.90	3.60	21
22	5/8 x 1 3/8 x 7	1/8 x 7/8	2 1/4	1.30	4.50	22
23	3/4 x 1 5/8 x 8	3/16 x 1	3 1/4	2.15	6.00	23
24	7/8 x 1 3/4 x 9	3/16 x 1 1/8	4 1/2	2.90	7.50	24
25	1 x2 x10	1/4 x 1 1/4	6 1/2	4.00	9.75	25
26	1 1/4 x 2 1/4 x 11	1/4 x 1 3/8	9	4.65	11.65	26

ARMSTRONG CUTTING-OFF TOOLS

Patented

Left Hand Off-Set

Each Tool is boxed separately and price includes Wrench and one High Speed Cutter.

Approximate sizes of Cutters are shown; actual sizes are slightly less. When ordering extra Cutters, please specify size and tool number.

No.	Size of Shank	Size of Cutter	Approx. Weight Each Pounds	Extra Cutter Blades. High Speed, Finished Each	Price Each Complete	No.
29-L	5/16 x 3/4	3/32 x 1/2	5/8	$0.60	$2.85	29-L
30-L	3/8 x 7/8	3/32 x 5/8	3/4	.65	3.00	30-L
31-L	1/2 x 1 1/8	1/8 x 3/4	1 1/2	.90	3.60	31-L
32-L	5/8 x 1 3/8	1/8 x 7/8	2 1/4	1.30	4.50	32-L
33-L	3/4 x 1 5/8	3/16 x 1	3 1/2	2.15	6.00	33-L
34-L	7/8 x 1 3/4	3/16 x 1 1/8	4 3/4	2.90	7.50	34-L
35-L	1 x 2	1/4 x 1 1/4	6 3/4	4.00	9.75	35-L
36-L	1 1/4 x 2 1/4	1/4 x 1 3/8	9	4.65	11.65	36-L

ARMSTRONG CUTTING-OFF TOOLS

Patented

Right Hand Off-Set

Each Tool is boxed separately and price includes Wrench and one High Speed Cutter.

Approximate sizes of Cutters are shown; actual sizes are slightly less. When ordering extra Cutters, please specify size and tool number.

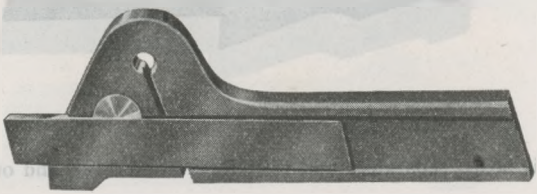
No.	Size of Shank	Size of Cutter	Approx. Weight Each Pounds	Extra Cutter Blades, High Speed, Finished Each	Price Each Complete	No.
29-R	5/16 x 3/4	3/32 x 1/2	5/8	$0.60	$2.85	29-R
30-R	3/8 x 7/8	3/32 x 5/8	3/4	.65	3.00	30-R
31-R	1/2 x 1 1/8	1/8 x 3/4	1 1/2	.90	3.60	31-R
32-R	5/8 x 1 3/8	1/8 x 7/8	2 1/4	1.30	4.50	32-R
33-R	3/4 x 1 5/8	5/16 x 1	3 1/2	2.15	6.00	33-R
34-R	7/8 x 1 3/4	5/16 x 1 1/8	4 3/4	2.90	7.50	34-R
35-R	1 x 2	1/4 x 1 1/4	6 3/4	4.00	9.75	35-R
36-R	1 1/4 x 2 1/4	1/4 x 1 3/8	9	4.65	11.65	36-R

ARMSTRONG SPRING CUTTING-OFF TOOL

Patented

Straight Shank

Cutting off in a lathe, always regarded as the hardest of lathe work, has been made comparatively simple by the Armstrong Spring-Cutting-Off Tool. The "goose neck" form of this tool gives the cutter a resiliency that takes up any chatter and keeps the work from climbing up on the tool—the cause of practically all cutting-off tool breakage.



Each Tool is boxed separately and price includes Wrench and one High Speed Cutter.

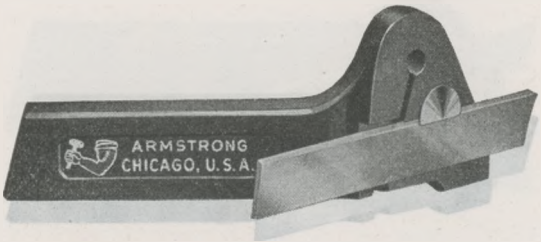
Approximate sizes of Cutters are shown; actual sizes are slightly less. When ordering extra Cutters, please specify size and tool number.

No.	Size of Shank	Size of Cutter	Approx. Weight Each Pounds	Extra Cutter Blades, High Speed, Finished Each	Price Each Complete	No.
S-20	3/8 x 7/8	3/16x 5/8	3/4	$0.65	$4.50	S-20
S-21	1/2 x 1 1/8	1/8x 3/4	1 1/2	.90	5.40	S-21
S-22	5/8 x 1 3/8	1/8x 7/8	2 1/4	1.30	6.75	S-22
S-23	3/4 x 1 5/8	5/16x1	3 1/2	2.15	9.00	S-23

ARMSTRONG SPRING CUTTING-OFF TOOL

Patented

Left Hand Off-Set



Each Tool is boxed separately and price includes Wrench and one High Speed Cutter.

Approximate sizes of Cutters are shown; actual sizes are slightly less. When ordering extra Cutters, please specify size and tool number.

No.	Size of Shank	Size of Cutter	Approx. Weight Each Pounds	Extra Cutter Blades, High Speed, Finished Each	Price Each Complete	No.
S-30-L	3/8 x 7/8	3/32 x 5/8	3/4	$0.65	$4.50	S-30-L
S-31-L	1/2 x 1 1/8	1/8 x 3/4	1 1/2	.90	5.40	S-31-L
S-32-L	5/8 x 1 3/8	1/8 x 7/8	2 1/4	1.30	6.75	S-32-L
S-33-L	3/4 x 1 5/8	3/16 x 1	3 1/2	2.15	9.00	S-33-L

Right Hand Offset shown on Page 28.

ARMSTRONG SIDE TOOLS

Patented

Right Hand Off-Set

Each Tool is boxed separately and price includes Wrench and one High Speed Cutter.

Approximate sizes of Cutters are shown; actual sizes are slightly less. When ordering extra Cutters, please specify size and tool number.

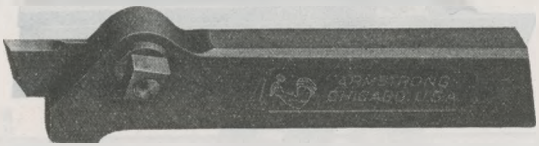
No.	Size of Shank	Size of Cutter	Approx. Weight Each Pounds	Extra Cutter Blades, High Speed, Finished Each	Price Each Complete	No.
69-R	5/16 x 3/4	1/8 x 1/2	5/8	$0.60	$2.85	69-R
70-R	3/8 x 7/8	5/32 x 5/8	3/4	.90	3.40	70-R
71-R	1/2 x 1 1/8	3/16 x 3/4	1 1/2	1.40	4.35	71-R
72-R	5/8 x 1 3/8	1/4 x 7/8	2 1/4	2.30	6.00	72-R
73-R	3/4 x 1 5/8	5/16 x 1	3 1/2	3.40	7.85	73-R
74-R	7/8 x 1 3/4	3/8 x 1 1/4	6	5.00	10.65	74-R
75-R	1 x 2	7/16 x 1 3/8	8 1/2	6.00	12.75	75-R
76-R	1 1/4 x 2 1/4	1/2 x 1 1/2	12 3/4	7.90	16.50	76-R

ARMSTRONG SIDE TOOLS

Patented

Left Hand Straight Shank

Our Straight Shank Side Tools are well adapted to use on the Planer and Shaper for many classes of work on which they will be found exceptionally convenient and efficient.



Each Tool is boxed separately and price includes Wrench and one High Speed Cutter.

Approximate sizes of Cutters are shown; actual sizes are slightly less. When ordering extra Cutters, please specify size and tool number.

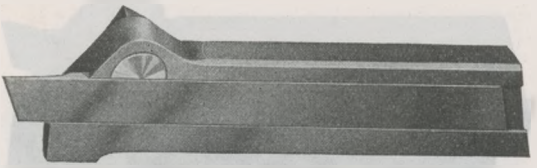
No.	Size of Holder	Size of Cutter	Approx. Weight Each Pounds	Extra Cutter Blades, High Speed, Finished Each	Price Each Complete	No.
79-L	5/16 x 3/4 x 4 1/2	1/8 x 1/2	5/8	$0.60	$2.85	79-L
80-L	3/8 x 7/8 x 5	5/32 x 5/8	3/4	.90	3.40	80-L
81-L	1/2 x 1 1/4 x 6	3/16 x 3/4	1 1/4	1.40	4.35	81-L
82-L	5/8 x 1 3/8 x 7	1/4 x 7/8	1 3/4	2.30	6.00	82-L
83-L	3/4 x 1 5/8 x 8	5/16 x 1	3 1/4	3.40	7.85	83-L
84-L	7/8 x 1 3/4 x 9	3/8 x 1 1/4	5	5.00	10.65	84-L
85-L	1 x 2 x 11	7/16 x 1 3/8	7 1/2	6.00	12.75	85-L
86-L	1 1/4 x 2 1/4 x 13	1/2 x 1 1/2	11	7.90	16.50	86-L

Right Hand Straight Shank shown on Page 32.

ARMSTRONG SIDE TOOLS

Patented

Right Hand Straight Shank



Each Tool is boxed separately and price includes Wrench and one High Speed Cutter.

Approximate sizes of Cutters are shown; actual sizes are slightly less. When ordering extra Cutters, please specify size and tool number.

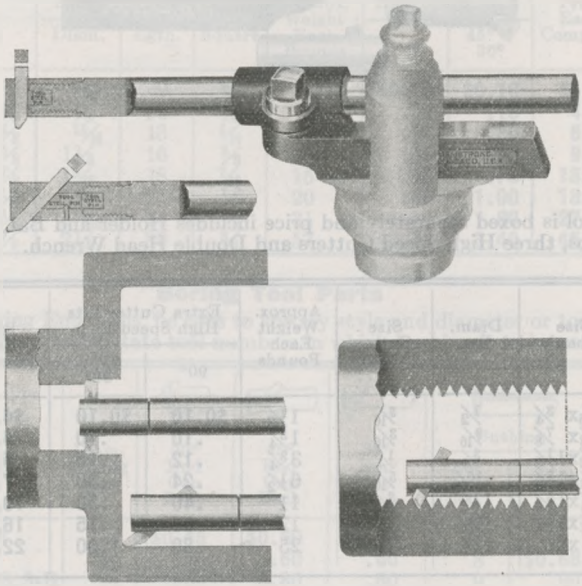
No.	Size of Holder	Size of Cutter	Approx. Weight Each Pounds	Extra Cutter Blades, High Speed, Finished Each	Price Each Complete	No.
79-R	5/16 x 3/4 x 4 1/2	1/8 x 1/2	5/8	$0.60	$2.85	79-R
80-R	3/8 x 7/8 x 5	5/32 x 5/8	3/4	.90	3.40	80-R
81-R	1/2 x 1 1/8 x 6	3/16 x 3/4	1 1/4	1.40	4.35	81-R
82-R	5/8 x 1 3/8 x 7	1/4 x 7/8	1 3/4	2.30	6.00	82-R
83-R	3/4 x 1 5/8 x 8	5/16 x 1	3 1/4	3.40	7.85	83-R
84-R	7/8 x 1 3/4 x 9	3/8 x 1 1/4	5	5.00	10.65	84-R
85-R	1 x2 x11	7/16 x 1 5/8	7 1/2	6.00	12.75	85-R
86-R	1 1/4 x 2 1/4 x 13	1/2 x 1 1/2	11	7.90	16.50	86-R

ARMSTRONG BORING TOOLS

Patented

The convenience and many practical advantages of this system of boring tools are known and appreciated in almost every modern machine shop. A half turn of one screw clamps or releases the bar which can be extended from the shank or holder to any desired length, giving the greatest degree of stiffness possible on every job.

The end caps used with this tool lock the cutters rigidly under a tool steel "automatic set screw" which cannot loosen while the tool is cutting, yet instantly releases the cutter for removal. The end caps are interchangeable without removing the bar. They are furnished in three styles: 90° for boring with single or double end cutter; 45° for boring and facing; and 30° for internal threading.



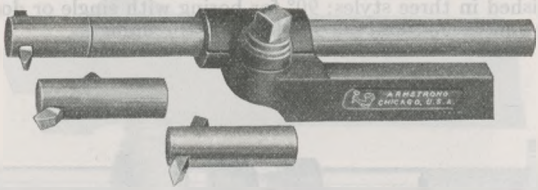
The above cut shows 90° End Cap with Double Ended Cutter roughing out cored hole and also 45° End Cap Cutter boring and facing end.

Showing 30° End Cap cutting internal thread.

ARMSTRONG BORING TOOLS

Patented

One of these tools, with a few pieces of steel for cutters, is equal in practical efficiency to a whole set of forged boring and inside threading tools.



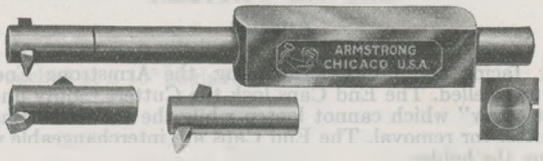
Each Tool is boxed separately and price includes Holder and Bar, 90°, 45° and 30° End Caps, three High Speed Cutters and Double Head Wrench.

No.	Size Shank	Diam. Bar	Size Cutter Square	Approx. Weight Each Pounds	Extra Cutter Bits High Speed Each		Price Each Complete	No.
					90°	45° & 30°		
00B	5/16 x 3/4	1/2	3/16	1 1/2	$0.10	$0.10	$4.90	00B
8	3/8 x 7/8	9/16	3/16	1 3/4	.10	.10	4.90	8
9	1/2 x 1 1/8	3/4	1/4	3 3/4	.12	.18	5.80	9
10	5/8 x 1 3/8	15/16	5/16	6 1/2	.24	.30	7.65	10
11	3/4 x 1 5/8	1 1/8	3/8	11	.40	.50	10.85	11
12	7/8 x 1 3/4	1 5/16	7/16	17	.55	.75	16.00	12
13	1 x2	1 1/2	1/2	25	.80	1.00	22.50	13

ARMSTRONG BORING TOOLS

Patented

Especially designed for use on lathes of British and European make having clamp tool rest and American lathes of similar design.



Each Tool is boxed separately and price includes Holder and Bar, 90°, 45° and 30° end caps, three High Speed Cutters and Double Head Wrench.

No.	Size of Shank	Dimen. of Bar		Size of Cutter Square	Approx. Weight Each Pounds	Extra Cutter Bits High Speed Each		Price Each Complete	No.
		Diam.	Lgth.			90°	45° & 30°		
108	¾x ⅞	9/16	9	3/16	1½	$0.10	$0.10	$4.15	108
109	1 x1⅛	¾	11	¼	3	.12	.18	4.90	109
110	1¼x1⅜	15/16	13	5/16	5½	.24	.30	6.50	110
111	1½x1⅝	1⅛	16	⅜	9	.40	.50	9.40	111
112	1¾x1⅞	1 5/16	18	7/16	15	.55	.75	13.50	112
113	2 x2⅛	1½	21	½	20	.80	1.00	18.00	113
114	2¼x2⅜	1 13/16	24	⅝	31	1.40	1.80	27.00	114
115	2¾x2⅞	2¼	30	¾	57	2.75	3.40	45.00	115

Boring Tool Parts

When ordering End Caps, be sure to specify style and diameter or tool number. Orders for Bushings must state tool numbers in which bushing is to be used.

For Use With Boring Tool No.	Diam. Boring Bar	90° End Cap Each	45° End Cap Each	30° End Cap Each	Bushing		Double Head Wrench Each
					For Tool* No.	Each	
00B, O-BB, 1-B	½	$0.45	$0.60	$0.60			$0.45
8, 108, 2-B	9/16	.45	.60	.60	8	$0.68	.45
9,109,O-BB,1-B,3-B	¾	.60	.80	.80	9	.90	.60
10, 110, 2-B, 4-B	13/16	.75	1.15	1.15	10	1.13	.75
11, 111, 1-B, 3-B	1⅛	.90	1.25	1.25	11	1.35	.90
12, 112, 2-B, 4-B	1 5/16	1.30	2.00	2.00	12	1.95	1.30
13, 113, 3-B	1½	1.95	3.00	3.00	13	3.00	1.95
114, 4-B	1 13/16	2.80	4.20	4.20	114	4.20	2.80
115	2¼	4.60	6.40	6.40	.....	.....	6.50

*Bushings listed for tools Nos. 8, 9, 10 can also be used in tools Nos. 108, 109, 110, etc.

ARMSTRONG BORING BARS

For Use in Armstrong Boring Tools

END CAP PATTERN

Patented

For boring, facing and internal threading, the Armstrong End Cap Pattern Boring Bar is unexcelled. The End Caps lock the Cutters rigidly under a tool steel "automatic set screw" which cannot loosen while the tool is cutting yet instantly releases the Cutter for removal. The End Caps are interchangeable without removing the bar from the holder.

Each Bar is boxed separately and price includes Bar with 90°, 45° and 30° End Caps, three High Speed Cutters, Double Head Wrench and Bushing. (No bushing with Nos. 013, 014, 015).

In ordering be careful to give size of shank (or number of tool) in which bar is to be used. When this information is not given no bushing will be included.

No.	Dimensions of Bar		Size of Cutter Square	With Bushing to Fit Shank	Approx. Wgt. Each Lbs.	Extra Cutter Bits High Speed Each		Price Each Complete	No.
	Diam.	Lgth.				90°	45° & 30°		
0B	1/2	8	3/16	No. 8, 9 or 10	3/4	$0.10	$0.10	$ 3.00	0B
08	9/16	9	3/16	No. 9, 10 or 11	1	.10	.10	3.00	08
09	3/4	11	1/4	No. 10, 11 or 12	2 1/4	.12	.18	3.75	09
010	15/16	13	5/16	No. 11, 12 or 13	4 1/2	.24	.30	5.40	010
011	1 1/8	16	3/8	No. 12 or 13	7	.40	.50	7.50	011
012	1 5/16	18	7/16	No. 13	11	.55	.75	10.50	012
013	1 1/2	23	1/2	Without Bushing	15	.80	1.00	13.50	013
014	1 13/16	28	5/8	Without Bushing	23	1.40	1.80	19.50	014
015	2 1/4	34	3/4	Without Bushing	44	2.75	3.40	34.50	015

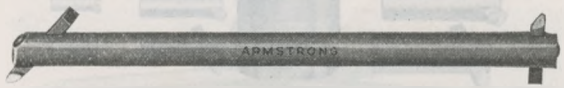
NOTE—These Boring Bars may be adapted to Screw Machines and Turret Lathes by using the Plain Turners described on page 55.

ARMSTRONG BORING BARS

For Use in Armstrong Boring Tools

PLAIN BAR

The Armstrong Plain Boring Bar has one end broached at a 90° angle and the opposite end broached at a 45° angle for square cutters.



Each Bar is boxed separately and price includes Bar with two High Speed Cutters, hollow set screw Wrench, and Bushing. In ordering, be careful to give size of shank (or number of tool) in which bar is to be used. When this information is not given no bushing will be included.

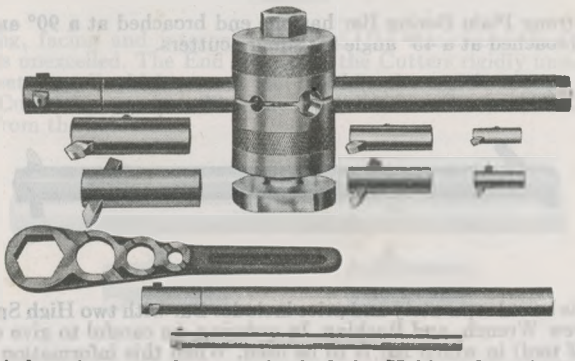
No.	Dimensions of Bar		Size of Cutter Square	With Bushing to Fit Shank	Approx. Wgt. Each Lbs.	Extra Cutter Bits High Speed Each		Price Each Complete	No.
	Diam.	Lgth.				90°	45°		
0B-X	½	8	3/16	No. 8, 9 or 10	¾	$0.10	$0.10	$2.40	0B-X
08-X	9/16	9	3/16	No. 9, 10 or 11	1	.10	.10	2.40	08-X
09-X	¾	11	¼	No. 10, 11 or 12	2¼	.12	.18	2.95	09-X
010-X	15/16	13	5/16	No. 11, 12 or 13	4½	.24	.30	4.25	010-X
011-X	1⅛	16	⅜	No. 12 or 13	7	.40	.50	6.25	011-X
012-X	1 5/16	18	7/16	No. 13	11	.55	.75	9.00	012-X
013-X	1½	23	½	Without Bushing	15	.80	1.00	11.75	013-X
014-X	1 11/16	28	⅝	Without Bushing	23	1.40	1.80	17.50	014-X
015-X	2¼	34	¾	Without Bushing	44	2.75	3.40	31.00	015-X

NOTE—These Boring Bars may be adapted to Screw Machines and Turret Lathes by using the Plain Turners described on page 55.

ARMSTRONG 3-BAR BORING TOOL

Patented

A slight turn of one nut releases or fastens both Bar and Holder. Bars can be changed as needed almost instantly, thus allowing the operator to use the stiffest bar possible for each job with the result that speeds and feeds can be increased and time saved.



Each Set is boxed separately and price includes Holder, three Armstrong Patent Boring Bars with 90°, 45° and 30° End Caps, nine High Speed Cutters and Armstrong Combination Wrench.

No.	Diameter Bars	Length of Bars	Size Cutters Square	For Lathes Swing Inches	Approx. Weight Complete Lbs.	Price Each Complete	No.
0-BB	3/8, 1/2, 3/4	7, 8, 11,	*, 3/16, 1/4	8 to 10	8	$14.00	0-BB
1-B	1/2, 3/4, 1 1/8	8, 11, 16	3/16, 1/4, 3/8	12 to 16	18	22.50	1-B
2-B	9/16, 15/16, 1 5/16	9, 13, 18	3/16, 5/16, 7/16	16 to 18	27	30.00	2-B
3-B	3/4, 1 1/8, 1 1/2	11, 16, 23	1/4, 3/8, 1/2	20 to 22	50	52.50	3-B
4-B	15/16, 1 5/16, 1 13/16	13, 18, 28	5/16, 7/16, 5/8	24 to 32	75	75.00	4-B

*¼" Bar is solid. For description, see page 39.

EXTRA CUTTER BITS—HIGH SPEED

Size, Inch Square		3/16	1/4	5/16	3/8	7/16	1/2	5/8
Each	90°	$0.10	$0.12	$0.24	$0.40	$0.55	$0.80	$1.40
	45° and 30°	$0.10	$0.18	$0.30	$0.50	$0.75	$1.00	$1.80

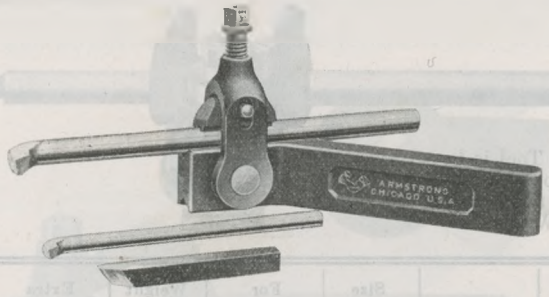
NOTE—Bolt Head and Bottom part of Holder are made of ample size to allow for fitting, which is necessary on account of the great variation in height of centers above slide rest and difference in sizes of T slots. FITTING—An extra charge of $2.00 net will be made for tools Nos. 1-B up when ordered fitted to special dimensions. Fitting charge for No. 0-BB, $0.75 net extra.

ARMSTRONG BORING TOOL HOLDER

Patented

For Small, Light Boring, Threading, Etc.

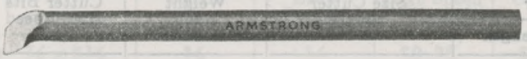
This Tool will be found very handy in the Tool Room or in Boring work of small internal diameter, Threading, Brass turning, etc. The Boring Bars furnished are made from the best high speed steel properly hardened, tempered and ground ready for use. The Holder is reversible, and can be used for turning either right or left hand as the floating tool steel gib allows the yoke to clear the end of the Holder.



Each Tool is boxed separately and price includes Holder, Wrench, two High Speed Boring Bars and one High Speed Cutter.

No.	Size of Shank	Size of Bars Furnished Diam.	Size of Square Cutter	Approx. Weight Each Pounds	Extra Cutter Bits High Speed Each	Price Each Complete	No.
15	3/8 x 3/4	3/16 and 1/4	1/4	1	$0.20	$4.15	15
16	1/2 x 1	3/16 and 5/16	5/16	1 3/4	.35	5.25	16
17	5/8 x 1 1/4	1/4 and 3/8	3/8	2 3/4	.55	6.75	17
18	3/4 x 1 1/2	5/16 and 7/16	7/16	4 1/2	.90	8.65	18

EXTRA BORING BARS



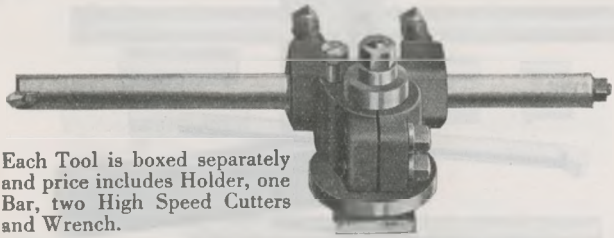
Extra Boring Bars are packed six of a size in a box.

Diameter	3/16	1/4	5/16	3/8	7/16
Length	4 1/2	5	6	7	8
Price each	$0.40	$0.50	$0.60	$0.80	$1.10

ARMSTRONG ADJUSTABLE BORING TOOL

Patented

This tool combines Convenience, Adjustability and Rigidity to a remarkable degree and is well adapted to a very wide range of work. The Holder is easily adjustable to different heights and will hold bars of various diameters. The Bars are made from high carbon steel seamless tubing of heavy gauge and are extremely stiff. The Cutter can be adjusted and solidly fixed at various angles for Boring, Facing or Turning.



Each Tool is boxed separately and price includes Holder, one Bar, two High Speed Cutters and Wrench.

No.	Capacity of Holder Diameter Bars	Size Bar Furnished	Size Cutter Square	For Lathes Swinging	Weight Each Pounds	Extra Cutter Bits High Speed Each	Price Each Complete	No.
212	¼ to 15/16	15/16 x21	3/8	14 to 18 in.	25	$0.50	$27.00	212
213	3/8 to 1½	1½ x24	7/16	16 to 20 in.	38	.75	37.50	213
214	½ to 1 13/16	1 13/16 x28	½	18 to 24 in.	75	1.00	60.00	214
215	5/8 to 2¼	2¼ x36	5/8	20 to 36 in.	120	1.80	90.00	215

NOTE—Bolt Head is made large enough to allow for fitting to T slots of various sizes.
FITTING—An extra charge of $1.00 net will be made for fitting Bolt Head to special dimensions.

PRICE LIST—EXTRA BARS

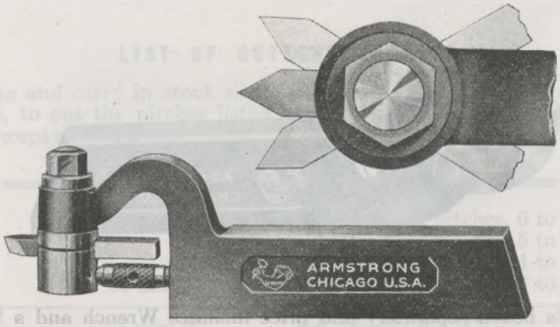
Price includes one Bar of size specified, two High Speed Cutters and Wrench.

Size of Bar		Size Cutter Square	Approx. Weight Each Pounds	Extra Cutter Bits High Speed Each	Price Each
Diameter	Length				
¾	14	5/16	1¾	$0.10	$ 4.85
15/16	16	¼	3¼	.18	6.00
1⅛	18	5/16	5	.30	8.25
1 5/16	21	3/8	7½	.50	11.25
1½	24	7/16	11	.75	15.00
1 13/16	28	½	19	1.00	22.50
2¼	36	5/8	38	1.80	42.00

ARMSTRONG SPRING THREADING TOOL

Patented

The Armstrong Spring Threading Tool is designed to combine strength and convenience of adjustment and operation with the resiliency which is considered by many machinists to be helpful in obtaining a smooth, finishing cut or thread especially on alloy steels of an extremely tough nature. Convenient means is also provided for obtaining complete rigidity when same is desirable as, for instance, in taking a roughing cut or doing an ordinary job of turning. The cutter can be held at different angles as shown.



Each Tool is boxed separately, and price includes one High Speed V Thread Cutter and a Drop Forged Wrench.

No.	Size of Holder	Size of Cutter Square	Approx. Weight Each Pounds	Extra Cutters High Speed Each	Price Each Complete	No.
S-50	3/8 x 7/8 x 5 1/2	3/16	1/2	$0.35	$4.15	S-50
S-51	1/2 x 1 1/8 x 6 1/2	1/4	1	.45	5.00	S-51
S-52	5/8 x 1 3/8 x 7 1/2	5/16	2	.55	6.40	S-52
S-53	3/4 x 1 3/8 x 8 1/2	3/8	3 1/4	.70	8.25	S-53

ARMSTRONG THREADING TOOLS

Patented

A Threading Tool is essentially a forming tool and any error or inaccuracy of shape or angle in the tool point will surely be reproduced in the thread and must result in poorly fitted work.

The cutters used in the Armstrong Threading Tool require grinding on the top edge only, to sharpen, and therefore always remain true to form and of correct angle; its use thus insures perfect fitting threads, and saves much grinding, as well as dispensing entirely with forging and tempering. The cutters are backed off to afford proper clearance. The back of cutter is eccentric in form and bears upon a hardened stop screw. This arrangement allows of positive and accurate adjustment.

Each Tool is boxed separately and price includes Wrench and a Single Point Cutter V, U. S. or Whitworth Standard.

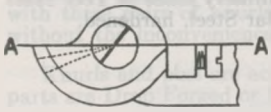
No.	Size of Holder	Approx. Weight Each Pounds	Price Each Complete With High Speed Cutter	No.
00T	5/16 x 3/4 x 5	3/4	$4.15	00T
50	3/8 x 7/8 x 5	7/8	4.15	50
51	1/2 x 1 1/8 x 6	1 1/2	5.00	51
52	5/8 x 1 3/8 x 7	2 1/4	6.40	52
53	3/4 x 1 5/8 x 8	3 1/2	8.25	53
54	7/8 x 1 3/4 x 9	4 1/4	9.75	54

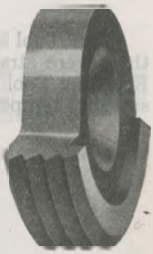
NOTE—In ordering tools equipped with U. S. or Whitworth cutters be careful to specify pitch or number of threads per inch wanted. Tools equipped with single point Sharp V cutter will always be shipped unless otherwise ordered.

CUTTERS FOR ARMSTRONG THREADING TOOL

Grinding and Adjusting Cutters

Always grind the cutter on a line from the point to the center, as indicated by the dotted lines in the accompanying outline view of cutter, then adjust the cutter so that the newly ground cutting edge represented by dotted lines is in a horizontal position or parallel to the line A. A. When fastening the cutter in position first see that Adjusting Screw is firmly set against heel of cutter, before pulling up nut.





Chaser Cutter

LIST OF CUTTERS FURNISHED

We make and carry in stock single point and chasing cutters in Treated High Speed Steel, to cut the pitches listed beneath in Sharp V, Whitworth and U. S. Standard, except as noted.

Single Point Cutters	No. 00T and 50	All standard pitches, 6 to 20, inclusive
	" 51	" " " 5 to 20, "
	" 52	" " " 4 to 20, "
	" 53 and 54	" " " 3 to 20, "
Chaser Cutters	No. 00T and 50	14, 16, 18, 20, 24*
	" 51	11½*, 12, 13†, 14, 16, 18, 20, 24*
	" 52	8, 9, 10, 11, 11½*, 12, 13†, 14, 16, 18, 20
	*V Thread only.	†Not made in Whitworth.

PRICE LIST OF CUTTERS

Sharp V, Whitworth or U. S. Standard Shape

For Tool No.	00T and 50		51		52		53 and 54
Made From	Single Point	Chaser	Single Point	Chaser	Single Point	Chaser	Single Point Only
High Speed Steel	$2.65	$4.15	$3.15	$5.00	$4.15	$6.40	$5.25

NOTE—When ordering cutters or chasers (except single point V cutters) it is necessary to specify exact pitch or number of threads per inch.

ARMSTRONG KNURLING TOOL

Patented

This Tool is self centering and the knuckle or joint has ample bearing to resist the severe strains of both end and side thrust. In these essentials the Armstrong Knurling Tool is unexcelled. The knurls and pins are accurately made of Tool Steel suitably tempered. All other parts are Drop Forged or Bar Steel, hardened.

For a complete description of the Hob-Cut Knurls furnished in this tool, see page 46.

Tools can be furnished with straight line knurls when specified. Standard face medium diamond knurls always furnished unless otherwise ordered.

Each Tool is boxed separately.

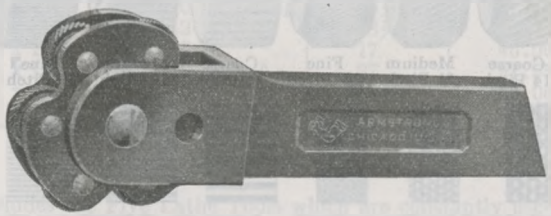
No.	Size of Holder	Dimensions of Knurls			Approx. Weight Each Lbs.	Knurling Capacity Diam.	Extra Knurls per Pair	Price Each Complete
		Diam.	Face (Stand.)	Hole				
00-K	5/16x 3/4x5	5/8	3/16	7/32	5/8	1/8 up	$1.00	$5.65
0-K	3/8x 7/8x5 1/2	5/8	3/16	7/32	7/8	1/8 up	1.00	6.00
1-K	1/2x1 1/8x6 1/2	3/4	1/4	1/4	1 1/2	3/16 up	1.15	6.75
2-K	5/8x1 3/8x7 1/2	3/4	1/4	1/4	2	3/16 up	1.15	8.00
4-K	7/8x1 3/4x9	1	1/4	5/16	4	1/4 up	2.00	14.00

ARMSTRONG KNURLING TOOL

With Revolving Head

The advantages of this tool are apparent at a glance. The revolving head is fitted with three pairs of knurls, fine, medium and coarse, either of which can be used without the inconvenience and loss of time incident to changing knurls.

Knurls and pins are accurately made of Tool Steel suitably tempered. All other parts are Drop Forged or Bar Steel, hardened.



For a complete description of the Hob-Cut Knurls furnished in this tool, see page 46.

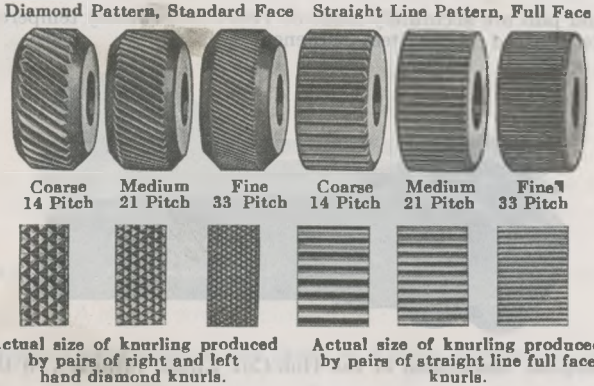
Tools can be furnished with straight line knurls when specified. Standard face diamond knurls always furnished unless otherwise ordered.

Each Tool is boxed separately.

No.	Size of Holder	Dimensions of Knurls			Approx. Weight Each Lbs.	Knurling Capacity Diam.	Extra Knurls per Pair	Price Each Complete
		Diam.	Face (Stand.)	Hole				
3-K-00	5/16 x 3/4 x 5	5/8	3/16	7/32	1	3/16 up	$1.00	$7.50
3-K-0	3/4 x 7/8 x 5 1/2	5/8	3/16	7/32	1 1/4	3/16 up	1.00	8.00
3-K-1	1/2 x 1 1/8 x 6 1/2	3/4	1/4	1/4	2	1/4 up	1.15	9.00
3-K-2	5/8 x 1 3/8 x 7 1/2	3/4	1/4	1/4	2 1/2	1/4 up	1.15	10.50

ARMSTRONG KNURLS

Armstrong Knurls are individually Hob-Cut to obtain sharp perfectly formed teeth in every knurl. Consequently, these knurls produce work of like precision and uniformity. Armstrong Knurls are held within close limits of accuracy for thickness and for diameter of hole which is always concentric under the Hob-Cut method of manufacture. They are cut from extra high-carbon tool steel, heat treated, tempered and tested.



NOTE—Pitch = number of teeth per linear inch.

Armstrong Knurls are furnished in pairs to fit all standard makes of knurling tools and are obtainable in diamond or straight line pattern, either standard or full face. When ordering, be sure to specify pitch, pattern, face and tool number or diameter of knurls. Unless otherwise specified on orders, medium diamond knurls with standard face will be furnished.

For Knurling Tool No.	Dimensions of Knurls					Price Per Pair
	Diameter	Standard Face Width	Full Face Width	Hole Diameter	Thickness	
00-K, 0-K	5/8	3/16	5/16	7/32	5/16	$1.00
3-K-00, 3-K-0	5/8	3/16	5/16	7/32	5/16	1.00
670, *671, 672	5/8	3/16	5/16	7/32	5/16	1.00
1-K, 2-K	3/4	1/4	3/8	1/4	3/8	1.15
3-K-1, 3-K-2	3/4	1/4	3/8	1/4	3/8	1.15
*673, 674	3/4	1/4	3/8	1/4	3/8	1.15
4-K	1	1/4	3/8	5/16	3/8	2.00

*Knurling tools for Screw Machines and Turret Lathes, described on page 60.

ARMSTRONG LATHE TOOL SETS

"Big Ten" Tool Holder Set

This set includes the ten tools shown on page 48 and is so complete as to cover the entire range of lathe work and to render entirely unnecessary the forging of tools with the attendant waste of time and material. Each Holder is equipped with Wrench and one High Speed Cutter. Each Set Nos. 00 to 2, inclusive, is furnished in a special steel case.

Set No.	Size of Tool Shanks	For Lathes (See Note)	Approx. Weight of Set Pounds	Price Set of Ten	Set No.
00	5/16 x 3/4	7 to 10 In. Swing	6½	$31.40	00
0	3/8 x 7/8	10 to 12 In. "	8½	33.40	0
1	½ x 1⅛	14 to 16 In. "	17	40.00	1
2	5/8 x 1⅜	16 to 18 In. "	27	51.55	2
3	¾ x 1⅝	18 to 20 In. "	43	69.00	3
4	⅞ x 1¾	24 to 36 In. "	62	90.00	4

"Handy Five" Tool Holder Set

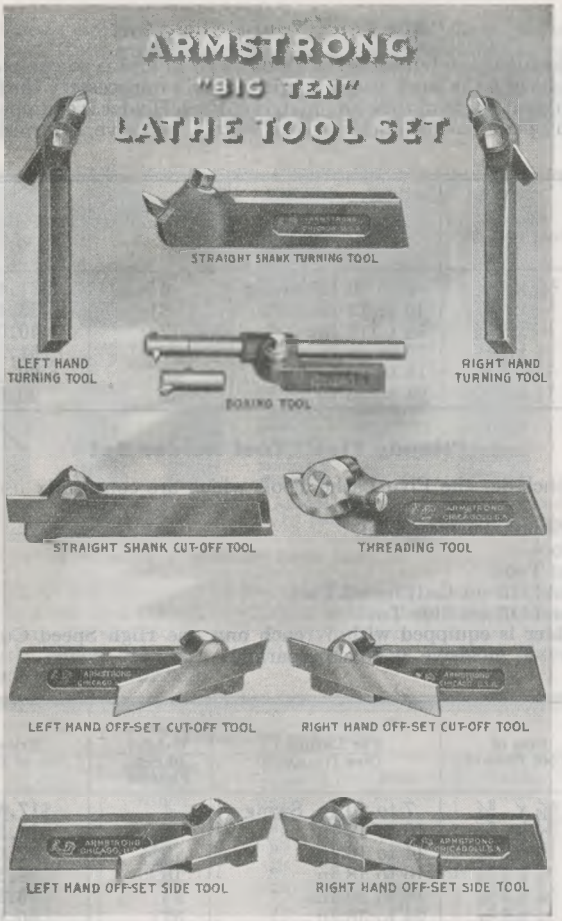
This set includes the Five Lathe Tools which are constantly used on ordinary work—

Straight Shank Turning Tool.
Boring Tool.
Threading Tool.
Right Hand Off-set Cutting-off Tool.
Right Hand Off-set Side Tool.

Each Holder is equipped with Wrench and one High Speed Cutter. Each Set Nos. 00-F to 2-F, inclusive, is boxed separately.

Set No.	Size of Tool Shanks	For Lathes (See Note)	Approx. Weight of Set Pounds	Price Set of Five	Set No.
00-F	5/16 x 3/4	7 to 10 In. Swing	4	$17.45	00-F
0-F	3/8 x 7/8	10 to 12 In. "	5	18.30	0-F
1-F	½ x 1⅛	14 to 16 In. "	9½	22.00	1-F
2-F	5/8 x 1⅜	16 to 18 In. "	16	28.55	2-F
3-F	¾ x 1⅝	18 to 20 In. "	25	38.35	3-F
4-F	⅞ x 1¾	24 to 36 In. "	37	50.80	4-F

NOTE—As there is a wide variation in the proportions of Lathes of different manufacture, it is only possible to give approximate size or swing of Lathes adapted to the use of tools of different sizes. Tool posts should be carefully measured before ordering tools.

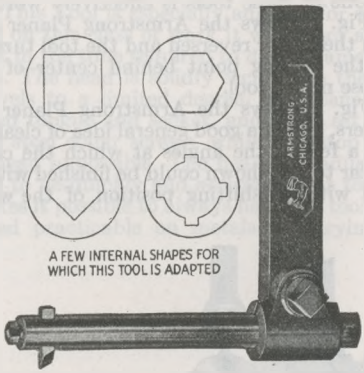


For details of this Set, see page 47.

ARMSTRONG EXTENSION SHAPER TOOL

Patented

This is an extremely rigid and convenient tool, well adapted for die work, cutting internal key ways, or for any kind of work on the Shaper in which extra clearance is needed.



Each Tool is boxed separately and price includes Holder and one Bar, one High Speed Cutter and Wrench.

No.	Size Shank	Size Bar	Size Cutter Square	Approx. Weight Each Pounds	Extra Cutter Bits High Speed Each	Price Each Complete	No.
*46	¾ x ⅞	½x7½	3/16	1⅛	$0.10	$4.00	46
47	½x1⅛	¾x10	5/16	3¼	.24	4.50	47
48	⅝x1⅜	15/16x12	⅜	6	.40	5.65	48
49	¾x1⅝	1⅛x14	7/16	9¾	.55	8.00	49

Extra Bars and Bushings

Price includes Bar, one Bushing, one High Speed Cutter and Wrench.

Dimensions of Bar		Size of Cutter Square	With Bushing to Fit Shank Number	Extra Cutter Bits High Speed Each	Price Each Complete
Diameter	Length				
½	7½	3/16	47, 48 or 49	$0.10	$2.85
⅝	8½	¼	47, 48 or 49	.12	3.00
¾	10	5/16	48 or 49	.24	3.30
15/16	12	⅜	49	.40	3.75
1⅛	14	7/16	Without Bushing	.55	3.75

NOTE—In ordering be careful to give size of shank (or number of tool) in which bar is to be used. When this information is not given no bushing will be included.

*No. 46 shank employs two hollow set screws to hold the bar instead of split collar illustrated.

ARMSTRONG PLANER AND SHAPER TOOLS

Patented

Convenient, Efficient and Economical

One of these tools is effectively worth a dozen forged tools. Fig. 1 shows the Armstrong Planer Tool cutting a keyway with the cutter reversed and the tool turned around, thus throwing the cutting point behind center of tool and working as a "goose neck" tool.

Fig. 2 shows the Armstrong Planer Tool at work in close corners, giving a good general idea of clearance obtained. It shows also a few of the angles at which the cutter can be set. A job similar to one shown could be finished with the Armstrong Planer Tool without shifting position of the work on bed.

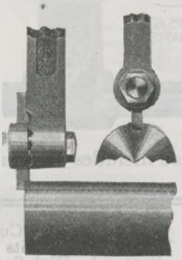


Fig. 1

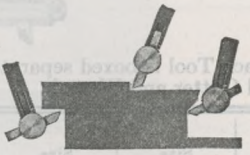


Fig. 2

Each Tool is boxed separately and price includes Wrench and one High Speed Cutter.

No.	Size of Holder	Size Cutter	Approx. Weight Each, lbs.	Extra Cutter Bits High Speed Each	Price Each Complete	No.
39*	3/8x 7/8x 5 1/2	1/4x 1/4	1	$0.20	$ 4.00	39
40*	1/2x1 x 6	1/4x 3/8	1 3/4	.35	4.65	40*
401*	5/8x1 1/4x 8 1/2	5/16x 1/16	3 1/4	.55	6.00	401*
41*	3/4x1 1/2x10	3/8x 1/2	5	.80	7.85	41*
42	1 1/8x1 3/4x13	1/2x 3/4	11	1.95	12.40	42
43	1 3/8x2 x16	5/8x 7/8	19 1/2	3.35	21.75	43
44	1 7/8x2 1/4x19	3/4x1	35	5.00	39.00	44
45	2 1/8x2 3/4x22	7/8x1 1/8	51	8.20	57.00	45

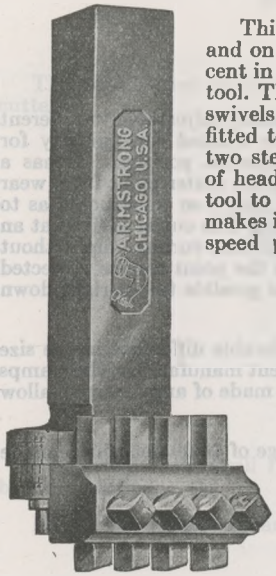
*Shaper sizes.

NOTE—Armstrong Carbide Tool Holders listed on pages 20 to 22 are also well adapted to planer and shaper work.

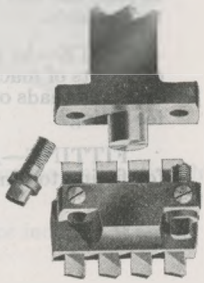
ARMSTRONG GANG PLANER TOOL

Patented

For Planing Large Surfaces



This Tool is especially adapted for surfacing large castings, and on this class of work it will effect a saving of 50 to 75 per cent in the time required to do the same job with a single point tool. The head is solidly secured to the shank, upon which it swivels to a limited degree, by means of a deep and closely fitted tongue and socket, and when set its position is fixed by two steel collar screws, while two stop screws render slipping of head impossible. The head is graduated, thus enabling the tool to be quickly and accurately set to any desired feed. This makes it possible to always have the tool cutting at the greatest speed practicable on metals of varying degrees of hardness.



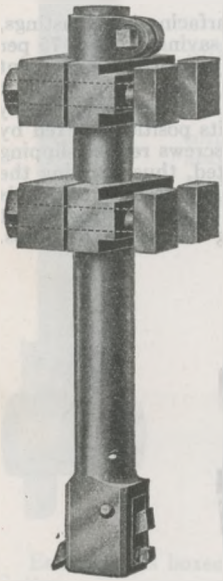
As each chip is comparatively light, a planer will, with this tool, carry with ease a feed and depth of cut much greater than is possible when using an ordinary tool, and there is much less tendency to "break out" at the end of cut. Each Tool is boxed separately and price includes one set (four) High Speed Cutters, Wrench and Grinding Gauge.

No.	Size Shank	Length Over All	Size Cutter	Feed Adjustment	Approx. Weight Each Pounds	Extra Cutter Bits High Speed Each	Price Each Complete	No
61	1¼x1¾x 7½	10	⅜x½	0 to ¼	10	$0.80	$26.00	61
62	1⅝x2¼x 9	12	½x¾	0 to ⅜	20	1.95	44.00	62
63	2 x2½x11	14	⅝x⅞	0 to ½	35	3.35	60.00	63

ARMSTRONG SLOTTER TOOL

WITH HOLLOW BAR

Patented



This tool is very stiff and easily adjustable to different lengths of stroke, and can be rotated conveniently for working into corners or in different positions. It has a spring relief block which saves the cutter point from wear and tear of the return stroke, and is so constructed as to be protected from chips and dirt. The cutter is fixed at an angle which allows it to take a clean curling chip without excessive top grinding, and as the point can be projected beyond the end of the bar it is possible to cut right down to the table.

NOTE—As there is considerable difference in the size of T slots of machines of different manufacture, the clamps and bolt heads of this tool are made of ample size to allow for fitting.

FITTING—An extra charge of $3.00 net will be made for fitting to dimensions.

Each Tool is boxed separately and price includes Wrench and one High Speed Cutter.

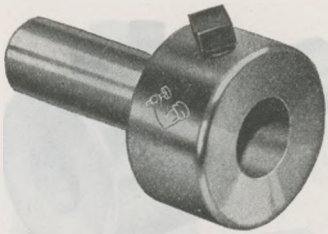
No.	For Slotting Machine, Inch Stroke	Diam. of Bar	Length Over All	Size of Cutter	Approx. Weight Each Pounds	Extra Cutter Bits High Speed Each	Price Each Complete	No.
91	6 and 8	1⅛	16	½x ¾	21	$1.95	$ 37.50	91
92	10 and 12	2	22	½x ¾	55	1.95	67.50	92
93	14 and 16	2¼	27	⅝x ⅞	78	3.35	97.50	93
94	18 and 20	2½	32	¾x1	108	5.00	138.00	94
95	22 and 24	2¾	37	⅞x1⅛	152	8.20	180.00	95

ARMSTRONG TOOL HOLDERS

For Screw Machines and Turret Lathes

PLAIN DRILL HOLDERS

This tool is used for holding drills, reamers, counterbores, hollow mills and flat cutters.



Armstrong Plain Drill Holders are hardened all over. The shank and bushing hole are ground.

Each Tool is boxed separately and price includes Wrench.

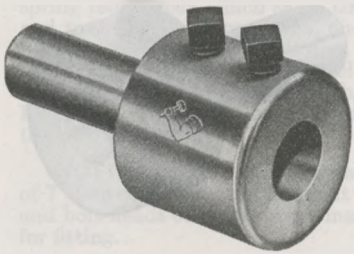
No.	Dimensions of Shank			Dimensions of Head			Extreme Length	Approx. Weight Each Pounds	Price Each
	Outside Diam.	Diam. Hole	Lgth.	Outside Diam.	Diam. Hole	Depth Hole			
600	5/8	13/32	2	1 3/4	3/4	3/4	3	3/4	$3.15
601	3/4	13/32	2	1 3/4	3/4	3/4	3	7/8	3.15
602	7/8	15/32	2 3/8	2	7/8	7/8	3 1/2	1 1/4	3.75
603	1	17/32	2 3/4	2 1/4	1	1	4	1 3/4	4.35
604	1 1/4	25/32	3 1/2	2 7/8	1 1/4	1 1/4	5 1/8	3 3/4	5.00
605	1 1/2	1 1/32	4 3/8	3	1 1/2	1 1/2	6 1/4	5	6.25

ARMSTRONG TOOL HOLDERS

For Screw Machines and Turret Lathes

DRILL HOLDERS

This tool is designed to hold either straight shank or taper shank drills. The bushing hole is extra deep and long bushings can be used to reach across several flutes on the drill. A rigid hold on the drill can be obtained under all conditions.



Armstrong Drill Holders are hardened all over. The shank and bushing hole are ground.

Each Tool is boxed separately and price includes Wrench.

No.	Dimensions of Shank			Dimensions of Head			Extreme Length	Approx. Weight Each Pounds	Price Each
	Outside Diam.	Diam. Hole	Lgth.	Outside Diam.	Diam. Hole	Depth Hole			
610	5/8	13/32	2 1/8	1 3/4	3/4	1 1/2	3 7/8	1 3/8	$4.30
611	3/4	13/32	2 1/8	1 3/4	3/4	1 1/2	3 7/8	1 1/2	4.30
612	7/8	15/32	2 1/4	2	7/8	1 3/4	4 1/4	2	4.70
613	1	17/32	2 3/8	2 1/4	1	1 13/16	4 1/2	2 3/4	5.65
614	1 1/4	25/32	3	2 7/8	1 1/4	2 1/8	5 1/2	5 1/8	6.25
615	1 1/2	1 1/32	3 5/8	3	1 1/2	2 3/8	6 1/2	6 1/4	7.85

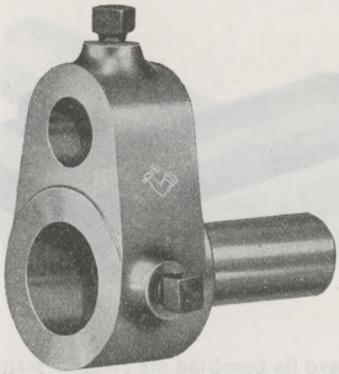
ARMSTRONG TOOL HOLDERS

For Screw Machines and Turret Lathes

PLAIN TURNERS

Drop Forged Steel

This tool is designed to combine a single cutter turning set up with drilling and boring operations. The top hole takes Cutter Holders (shown on pages 56, 57 and 58), while the center tool bushing hole locates drills, boring bars and other similar tools. Plain Turners may be held independently or mounted in multiple heads by using tool shank bushings.



Armstrong Plain Turners are drop forged from specia steel, hardened all over. Center hole and shank are ground.

Each Tool is boxed separately and price includes Wrench.

No.	Dimensions of Shank			Dimensions of Head			Turning Capacity		Extreme Lgth.	Approx. Wgt. Each Lbs.	Price Each
	Outside Dia.	Dia. Hole	Lgth.	Dia. Top Hole	Dia. Center Hole	Depth Center Hole	Diameter	Max. Lgth.			
620	5/8	3/8	2 1/2	3/4	3/4	1 1/8	1/2 to 1 1/4	2	3 7/8	1 1/2	$ 8.15
621	7/8	1/2	2 1/2	3/4	3/4	1 1/8	1/2 to 1 1/4	2	3 7/8	1 3/4	8.15
622	1	5/8	3	7/8	1 1/4	1 1/8	1/2 to 2	2 3/4	4 1/2	3	9.40
623	1 1/4	3/4	3 1/4	1	1 5/8	1 3/8	3/4 to 2	3 1/4	5 1/8	4 3/4	11.90
624	1 1/2	7/8	3 5/8	1 1/4	1 5/8	1 3/8	2 1/4 to 3 1/2	4 1/4	5 1/2	6 7/8	15.65
625	1 3/4	1	3 7/8	1 1/2	1 3/4	1 1/2	3 3/4 to 5	5	5 15/16	10 1/2	18.75

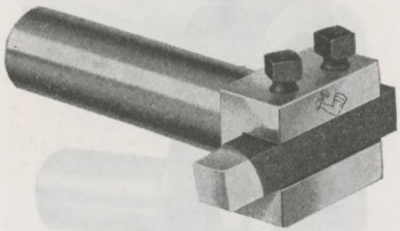
NOTE—For Boring Bars and Cutters, see pages 36 and 37.

ARMSTRONG TOOL HOLDERS

For Screw Machines and Turret Lathes

STRAIGHT CUTTER HOLDERS

This tool is used for turning, facing, chamfering, boring and similar work. The tool slot will take either square or flat cutters which may be ground to any required form. It can be held in the Plain Turners described on page 55 or mounted in multiple heads by using tool shank bushings. The tool is moved in or out of the support for length of cut.



Armstrong Straight Cutter Holders are hardened all over and the shank is ground.

Each Tool is boxed separately and price includes one High Speed Cutter Bit and Wrench.

No.	Diam. of Shank	Length of Shank	Size *of Cutter	Extreme Length	Approx. Weight Each Pounds	Cutter Bits High Speed Each	Price Each
630	5/8	2 1/2	1/4 x 1/4 x 1 3/4	3 1/8	3/4	$0.18	$5.00
631	3/4	2 1/2	1/4 x 1/4 x 1 3/4	3 1/8	7/8	.18	5.00
632	7/8	3 1/4	3/8 x 3/8 x 2 5/8	4	1 1/4	.50	6.00
633	1	4	1/2 x 1/2 x 3 1/4	4 7/8	1 7/8	1.00	6.90
634	1 1/4	4 3/4	5/8 x 5/8 x 4	5 7/8	3 1/2	1.80	8.15
635	1 1/2	5 1/2	3/4 x 3/4 x 5	6 3/4	5 1/2	3.40	9.35

*For other sizes H. S. Bits, see page 63. For Stellite and Armide Cutters, see pages 17 and 67.

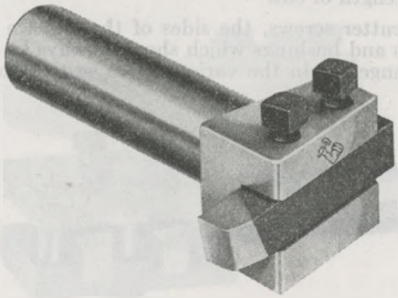
ARMSTRONG TOOL HOLDERS

For Screw Machines and Turret Lathes

ANGLE CUTTER HOLDERS

In this tool, the cutter is held at an angle of 15° which provides clearance necessary for turning close to a shoulder or to chuck jaws.

Used for turning and boring, this tool can be held in the Plain Turners described on page 55 or mounted in multiple heads by using tool shank bushings. The tool is moved in or out of the support for length of cut.



Armstrong Angle Cutter Holders are hardened all over and the shank is ground.

Each Tool is boxed separately and price includes one High Speed Cutter Bit and Wrench.

No.	Diam. of Shank	Length of Shank	Size *of Cutter	Extreme Length	Approx. Weight Each Pounds	Cutter Bits High Speed Each	Price Each
640	5/8	2 1/2	1/4 x 1/4 x 1 3/4	3 1/4	7/8	$0.18	$5.00
641	3/4	2 1/2	1/4 x 1/4 x 1 3/4	3 1/4	1	.18	5.00
642	7/8	3 1/4	3/8 x 3/8 x 2 5/8	4 1/4	1 3/8	.50	6.00
643	1	4	1/2 x 1/2 x 3 1/4	5 1/4	2	1.00	6.90
644	1 1/4	4 3/4	5/8 x 5/8 x 4	6 1/4	3 5/8	1.80	8.15
645	1 1/2	5 1/2	3/4 x 3/4 x 5	7 1/4	5 1/2	3.40	9.35

*For other sizes H. S. Bits, see page 63. For Stellite and Armide Cutters, see pages 17 and 67

ARMSTRONG TOOL HOLDERS

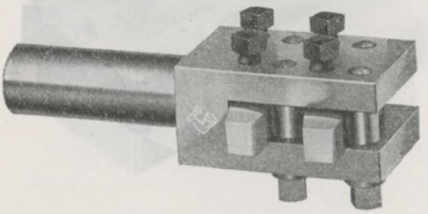
For Screw Machines and Turret Lathes

MULTIPLE CUTTER HOLDERS

In this tool, two cutters can be held in various positions for turning or boring two diameters at the same time and for combining facing or chamfering with turning or boring operations.

Multiple Cutter Holders can be held in the Plain Turners described on page 55, or mounted in multiple heads by using tool shank bushings. The tool is moved in or out of the support for length of cut.

When setting the cutter screws, the sides of the tool are kept from springing apart by the tie screws and bushings which should always be used. Tie screws and set screws are interchangeable in the various holes so that the cutters may be set as desired.



Armstrong Multiple Cutter Holders are hardened all over and the shank is ground.

Each Tool is boxed separately and price includes two High Speed Cutter Bits and Wrench.

No.	Diam. of Shank	Length of Shank	Size *of Cutter	Extreme Length	Approx. Weight Each Pounds	Cutter Bits High Speed Each	Price Each
650	5/8	2 1/2	1/4 x 1/4 x 1 3/4	4 5/8	1 1/8	$0.18	$5.65
651	3/4	2 1/2	1/4 x 1/4 x 1 3/4	4 5/8	1 1/4	.18	5.65
652	7/8	3 1/4	3/8 x 3/8 x 2 5/8	5 13/16	2 1/4	.50	6.60
653	1	3 1/4	1/2 x 1/2 x 3 1/4	6 1/4	3 3/8	1.00	7.85
654	1 1/4	3 1/2	5/8 x 5/8 x 4	7 1/8	5 7/8	1.80	9.10
655	1 1/2	4 1/2	3/4 x 3/4 x 5	8 7/8	9 7/8	3.40	10.35

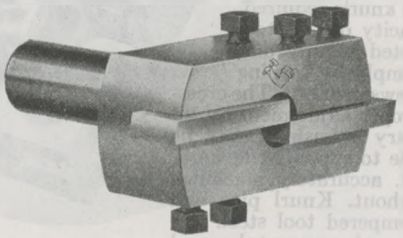
*For other sizes H. S. Bits, see page 63. For Stellite and Armide Cutters, see pages 17 and 67.

ARMSTRONG TOOL HOLDERS

For Screw Machines and Turret Lathes

FACING TOOLS

These facing tools are used for machining pulleys, gear hubs, flanges and like parts. A solid disc can be faced to the center or the cutters may be ground and adjusted for grooving, recessing, face-forming and counterboring. In conjunction with the latter operations, drills, counterbores, pilots and other tools can be held in the center hole.



Armstrong Facing Tools are hardened all over. The shank and center hole are ground.

Each Tool is boxed separately and price includes two High Speed Cutter Bits and Wrench.

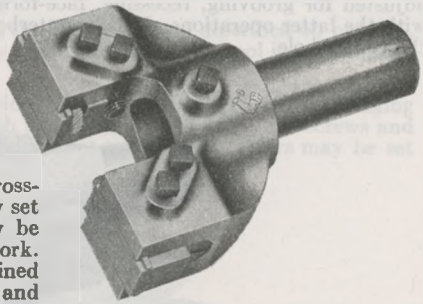
No.	Dimensions of Shank			Dimensions of Head			Facing Capacity 0 to Max. Diam.	Extreme Lgth.	App. Wgt. Each Lbs.	Extra Cutter Bits High Speed Each	Price Each
	Outside Dia.	Dia. Hole	Lgth.	Width	Size of Cutter Bit	Dia. Center Hole					
660	5/8	25/64	1 7/8	2 3/4	1/4 x 3/4	5/8	0 to 3	3 1/4	1 3/8	$0.70	$10.00
661	3/4	25/64	1 7/8	2 3/4	1/4 x 3/4	5/8	0 to 3	3 1/4	1 1/2	.70	10.00
662	7/8	29/64	2 1/16	3 1/4	1/4 x 3/4	5/8	0 to 3 1/2	4	2 3/8	.70	12.50
663	1	17/32	2 1/4	4	5/16 x 7/8	3/4	0 to 4 1/2	4	3 1/2	1.10	15.65
664	1 1/4	21/32	2 15/16	4 3/4	3/8 x 1	7/8	0 to 5 1/4	5 1/2	7	1.60	19.40
665	1 1/2	29/32	3 3/4	5	3/8 x 1	7/8	0 to 5 3/4	5 1/2	7 5/8	1.60	22.50

ARMSTRONG TOOL HOLDERS

For Screw Machines and Turret Lathes

TURRET KNURLING TOOLS

Drop Forged Steel



This tool is designed to hold standard size knurls. Any pattern or pitch knurling may be produced by running out the cross-slides, removing the knurl pins and inserting the knurls required.

The knurling capacity of this tool can be quickly adjusted to any diameter within range simply by turning the cross-slide feed screws in or out. The cross-slides are locked at proper adjustment by set screws. When necessary a bushing may be used in the center hole to support the work.

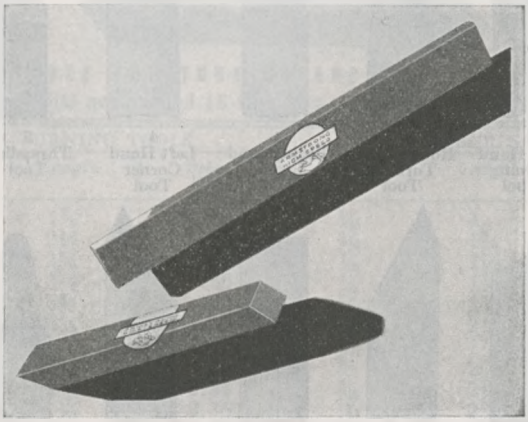
Drop forged steel, accurately machined and hardened throughout. Knurl pins and hob-cut knurls are tempered tool steel.

Each Tool is boxed separately and equipped with one pair of medium diamond knurls with standard face. On specification, tools will be equipped with any standard pattern or pitch Armstrong Hob-Cut Knurls of proper size. Medium diamond knurls with standard face always supplied unless otherwise specified.

No.	Dimensions of Shank			Knurling Capacity		Max Width Head	Extreme Lgth.	Approx. Weight Each Lbs.	Extra* Knurls Per Pair	Price Each
	Dia.	Dia. Hole	Lgth.	Diam.	Max. Lgth.					
670	5/8	7/16	2 1/2	1/8 to 3/4	1 5/8	3 1/2	4 13/16	2 1/2	$1.00	$24.00
671	1	7/16	2 1/2	1/8 to 3/4	1 5/8	3 1/2	4 13/16	2 3/4	$1.00	24.00
672	1 1/4	21/32	3	1/8 to 1	2 1/2	4 3/4	6 1/8	5 1/8	1.00	37.50
673	1 1/2	13/16	3 7/16	1/4 to 1 1/2	3 1/4	6 1/4	7 11/16	9 3/4	1.15	50.00
674	1 3/4	29/32	3 5/8	1/2 to 2	4	7 3/8	8 7/8	17	1.15	62.50

*For description and specifications of knurls, see page 46.

ARMSTRONG HIGH SPEED BITS, CUTTERS AND BLADES



Though it is an outstanding advantage of the Armstrong System of Tool Holders, that Armstrong Tool Holders take cutters of standard shapes of High Speed Steel, the use of ordinary high speed steels that can be bought by the pound is not recommended. The cost of the steel actually consumed is so insignificant when compared with the machine and labor costs, and the quality of the cutter is so important in determining the accomplishment of both men and machines, that the only sound and truly economical method is to use only the very finest steel obtainable. In Armstrong High Speed Bits and Blades, we offer this very finest cutting steel, especially developed for use in Armstrong Tool Holders.

Armstrong High Speed Bits and Blades are strictly speaking fine tools in the rough. Each is cut to proper size, is carefully heat treated, is hardened, tempered and tested. Superior to steels sold by the pound, Armstrong High Speed steel has been made still better with a new super-steel that makes practicable the machining of from 25 to 100 more feet per minute, and at the same time reduces tool grinding materially. Every Armstrong High Speed Bit, Cutter and Blade carries the blue and gold emblem.

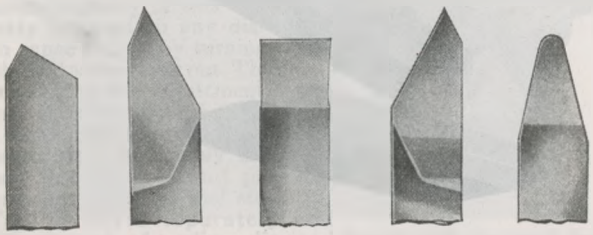
Armstrong High Speed steel cuts cutting costs on all machines.

HIGH SPEED CUTTERS

For Armstrong Tool Holders

Finished

1 Left Hand Turning Tool | 2 Round Nose Turning Tool | 3 Right Hand Turning Tool | 4 Left Hand Corner Tool | 5 Threading Tool



6 Right Hand Corner Tool | 7 Left Hand Side Tool | 8 Square Nose Tool | 9 Right Hand Side Tool | 10 Brass Tool

These Cutters are made from our best high speed steel. Finished Cutters are heat treated, hardened, ground to the form shown and ready to use.

The prices listed apply to any of the shapes illustrated. When ordering please specify catalog numbers.

Above Cutters in sizes 3/16" to 1/2", inclusive, are boxed in sets of 10 Cutters, shapes 1 to 10.

Size of Cutter, Square	Length	Finished Price Each	Size of Cutter, Square	Length	Finished Price Each
3/16	1 3/4	$0.25	5/8	5	$2.50
1/4	2 1/4	.30	3/4	5 3/4	4.10
5/16	2 3/4	.45	7/8	6 1/2	6.00
3/8	3 1/4	.65	1	7 1/4	8.60
7/16	3 3/4	1.00	1 1/8	8	11.90
1/2	4 1/4	1.45			

Special cutter forms (or modifications of those shown) if needed will be suggested by the character of the work to be done and the nature of the metal to be machined.

A Grinding Chart showing Settings and Angles for grinding Armstrong Cutters on the Gisholt Tool Grinder will be furnished on request. We will also furnish on request a chart showing the protractor angles to which cutters for Armstrong Tool Holders should be ground for average work.

ARMSTRONG HIGH SPEED STEEL BITS

Unfinished — Hardened

Require Grinding Only to Make Them Ready for Use in Armstrong Tool Holders

SQUARES FOR TURNING AND BORING TOOLS

Turning Tool Bits are packed 12 to a box, sizes 3/16" to 1/2", inclusive.

FOR TURNING TOOLS			FOR BORING TOOLS		
Size	Length	Price Each	Size	Length	Price Each
3/16	1 3/4	$0.15	3/16	1	$0.10
1/4	2 1/8	.20	3/16	1 1/4	.10
5/16	2 3/4	.35	1/4	1 1/4	.12
3/8	3 1/4	.55	1/4	1 3/4	.18
7/16	3 3/4	.90	5/16	1 1/2	.24
1/2	4 1/4	1.30	5/16	2 1/4	.30
5/8	5	2.35	3/8	1 7/8	.40
3/4	5 3/4	3.85	3/8	2 5/8	.50
7/8	6 1/2	5.85	7/16	2 1/8	.55
1	7 1/4	8.35	7/16	2 7/8	.75
1 1/8	8	11.35	1/2	2 3/8	.80
			1/2	3 1/4	1.00
			5/8	2 3/4	1.40
			5/8	4	1.80
			3/4	3 1/8	2.75
			3/4	5	3.40

FLATS FOR PLANER AND SLOTTER TOOLS

FOR PLANER TOOLS			FOR SLOTTER AND GANG PLANER TOOLS		
Size	Length	Price Each	Size	Length	Price Each
1/4 x 3/8	2 1/2	$0.35	1/2 x 3/4	4 1/4	$1.95
5/16 x 7/16	3	.55	5/8 x 7/8	5	3.35
3/8 x 1/2	3 1/2	.80	3/4 x 1	6	5.00
1/2 x 3/4	4 1/4	1.95	7/8 x 1 1/8	7	8.20
5/8 x 7/8	5	3.35	3/8 x 1/2	3 1/2	.80
3/4 x 1	6	5.00	1/2 x 3/4	4 1/4	1.95
7/8 x 1 1/8	7	8.20	5/8 x 7/8	5	3.35

For Stellite Cutter Bits, see page 17.

HIGH SPEED CUTTER BLADES

For Cutting Off and Side Tools

Finished

These Cutter Blades are made from our best high speed steel. Finished Cutter Blades are heat treated, hardened, ground on the edges and are ready to use in Armstrong Tool Holders. Approximate sizes of blades are shown; actual sizes are somewhat less. When ordering, please specify size and tool number.

Bevel Blades for Cutting Off Tools are packed 12 to a box, sizes 3/32" x 1/2" to 3/16" x 1", inclusive.

BEVEL FOR CUTTING OFF TOOLS

Size	Length	Price, Each	For Tools, Nos.
3/32 x 1/2	4 1/2	$0.60	19, 29-L, 29-R
3/32 x 5/8	5	.65	20, 30-L, 30-R
1/8 x 3/4	6	.90	21, 31-L, 31-R
1/8 x 7/8	7	1.30	22, 32-L, 32-R
3/16 x 1	8	2.15	23, 33-L, 33-R
3/16 x 1 1/8	9	2.90	24, 34-L, 34-R
1/4 x 1 1/4	10	4.00	25, 35-L, 35-R
1/4 x 1 3/8	11	4.65	26, 36-L, 36-R

NOTE—Blades listed for tools Nos. 20, 30-L, etc., are also for use in Spring Cutting Off Tools S-20, S-30-L, etc.

Armstrong Cutting Off Tools are listed on pages 23-28.

SPECIAL SHAPE FOR SIDE TOOLS

Size	Length	Price, Each	For Tools, Nos.
1/8 x 1/2	4 1/2	$0.60	69-L, 69-R, 79-L, 79-R
5/32 x 5/8	5	.90	70-L, 70-R, 80-L, 80-R
3/16 x 3/4	6	1.40	71-L, 71-R, 81-L, 81-R
1/4 x 7/8	7	2.30	72-L, 72-R, 82-L, 82-R
5/16 x 1	8	3.40	73-L, 73-R, 83-L, 83-R
3/8 x 1 1/4	9	5.00	74-L, 74-R, 84-L, 84-R
7/16 x 1 3/8	10	6.00	75-L, 75-R, 85-L, 85-R
1/2 x 1 1/2	11	7.90	76-L, 76-R, 86-L, 86-R

Armstrong Side Tools are listed on pages 28-32

ARMSTRONG HIGH SPEED STEEL BITS

Unfinished — Hardened

Require Grinding Only to Make Them Ready for Use in Armstrong Tool Holders

BEVEL FOR CUTTING-OFF TOOLS

Size	Length	Price Each
1/32 x 1/2	4 1/2	$0.40
3/32 x 5/8	5	.40
1/8 x 3/4	6	.65
1/8 x 7/8	7	.95
5/16 x 1	8	1.75
3/16 x 1 1/8	9	2.20
1/4 x 1 1/4	10	3.40
1/4 x 1 3/8	11	4.00

SPECIAL SHAPE FOR SIDE TOOLS

Size on Lines AA and BB	Length	Price Each
1/8 x 1/2	4 1/2	$0.45
5/32 x 5/8	5	.50
3/16 x 3/4	6	.85
1/4 x 7/8	7	1.45
5/16 x 1	8	2.20
3/8 x 1 1/4	9	3.40
7/16 x 1 3/8	10	4.60
1/2 x 1 1/2	11	7.35

NOTE—Bevel and Special Shapes are rolled to approximate size, but require grinding on edges to bring to exact size fitting Armstrong Cutting-Off and Side Tool Holders. For prices of finished Cutters fitting Cutting-Off and Side Tool Holders, see page 64.

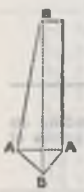
ARMSTRONG SPECIAL SELF-HARDENING TOOL HOLDER STEEL

In Three Foot Bars

Ready to Use — No Treatment Required

SQUARES	Size	Price Per 3 Ft. Bar	Size	Price Per 3 Ft. Bar
 For use in Armstrong Turning and Boring Tools.	5/16	$1.20	5/8	$11.10
	1/4	2.00	3/4	15.80
	5/16	3.00	7/8	21.30
	3/8	4.25	1	28.20
	7/16	5.60	1 1/8	34.35
	1/2	7.10		
FLATS				
 For use in Armstrong Planer and Slotter Tools.	1/4 x 3/8	$3.10	5/8 x 7/8	$15.60
	5/16 x 7/16	4.25	3/4 x 1	20.65
	3/8 x 1/2	5.85	7/8 x 1 1/8	27.30
	1/2 x 3/4	11.00		

	Size	Price Per 3 Ft. Bar
 **BEVEL** For use in Armstrong Cutting-Off Tools.	3/32 x 1/2	$2.40
	3/32 x 5/8	2.40
	1/8 x 3/4	3.55
	1/8 x 7/8	3.75
	3/16 x 1	6.00
	3/16 x 1 1/8	6.60
	1/4 x 1 1/4	9.25
	1/4 x 1 3/8	9.60

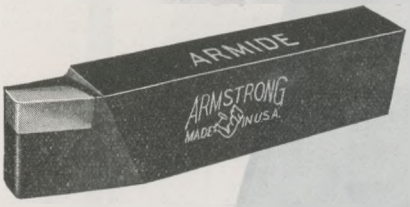
	Size of Steel on lines AA and BB Inches	Price Per 3 Ft. Bar
 **SPECIAL SHAPE** For use in Armstrong Side Tools	1/8 x 1/2	$2.50
	5/32 x 5/8	3.30
	3/16 x 3/4	4.15
	1/4 x 7/8	5.85
	5/16 x 1	7.60
	3/8 x 1 1/4	10.60
	7/16 x 1 3/8	12.75
	1/2 x 1 1/2	18.65

NOTE—Steel for Side Tools and Cutting-Off Tools is rolled to approximate size, but requires grinding on edges to bring to exact size fitting Armstrong Cutting-Off and Side Tool Holders.

ARMIDE CUTTERS

Armide is an improved Carbide Cutting Metal, a new type Carbide Alloy. It approaches the diamond in hardness ((88 to 92 Rockwell A) and will machine chilled cast iron, hard and tough steels, hard rubber, bakelite and other materials without appreciable loss of edge.

Armide remains cool and securely brazed at all times because of its extremely low thermal conductivity. Its edge stays smooth and clean, for Armide will not alloy with steel or iron. This characteristic prevents "grooving"—the prime cause of cutting edge breakdown. On ordinary operations Armide Cutters permit greatly increased speeds and extend the tool life from 10 to 200 times that of high speed steel.



Armide Cutters are furnished in five standard forms, ground and ready for use. All forms shown are available on either "flat" or "square" bodies. "Flat" cutters are recommended for general use. Each Cutter is boxed separately. For Tool Holders, see pages 20-22.

A Right hand turning and facing.

B Left hand turning and facing.

C Square Nose.

D Round Nose general turning and facing.

E 60° Threading.

Shape of* Cutter Body	Size	Length	Price Each	Shape of* Cutter Body	Size	Length	Price Each
SQUARES	1/4	1 3/4	Prices on Application	FLATS	1/4 x 3/8	1 3/4	Prices on Application
	5/16	2 1/4			5/16 x 7/16	2 1/4	
	3/8	2 1/2			3/8 x 1/2	2 1/2	
	7/16	3			7/16 x 9/16	3	
	1/2	3 1/2			1/2 x 3/4	3 1/2	
	5/8	4			5/8 x 7/8	4	

*Be sure and specify by letter form of cutter desired, also whether square or flat. Square bodied cutters will be shipped unless flat is specified. Special sizes and shapes of Armide Cutters can be furnished; prices on receipt of specifications.

ARMIDE TOOL SETS

These Sets permit the advantages of Carbide Cutting Tools for many operations without the excessive cost of special tools.

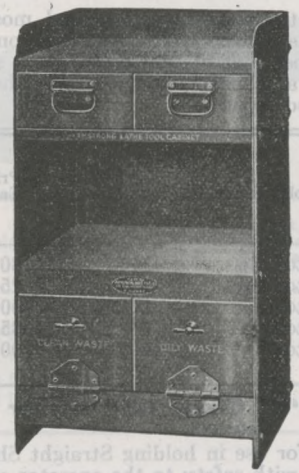
The Armstrong Carbide Tool Holders furnished in these Sets are listed on page 20. The Armide Cutters furnished are fully described on page 67.

Each Set comes in a specially made, finely finished case complete with Holder, Wrench and Cutters as listed.

Set No.	Size of Tool Shanks	Size of Cutters	Cutter Shapes, Included	Approx. Weight, Pounds	Price, Set Complete	Set No.
1	½ x 1¼ x 7	5/16 x 7/16	A, B, C, D	2¾	$45.00	1
1-A	½ x 1¼ x 7	5/16 sq.	A, B, C, D	2¾	45.00	1-A
2	5/8 x 1½ x 8	3/8 x ½	A, B, C, D, E	6	60.00	2
2-A	5/8 x 1½ x 8	3/8 sq.	A, B, C, D, E	6	60.00	2-A

ARMSTRONG "ALL STEEL" LATHE TOOL CABINETS

Patented



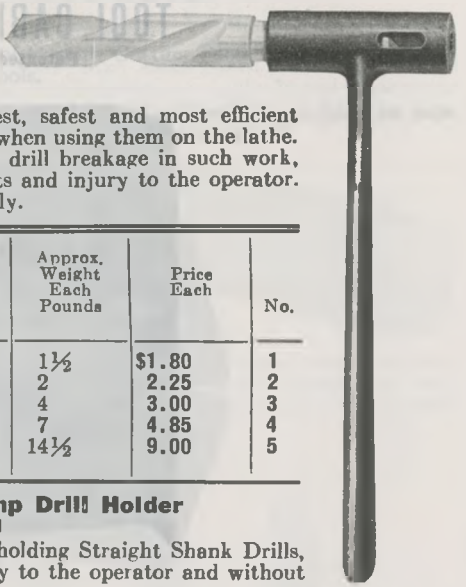
These handsome cabinets are especially adapted for Armstrong Lathe Tool Sets; they not only add to the systematic and orderly appearance of the shop, but they will save much time that is ordinarily wasted hunting for mislaid tools, as they keep together each man's tools, chuck, waste, and other equipment within easy reach at all times.

They also conform to the modern shop practice of replacing wood with non-combustible materials wherever possible, and furnish separate, automatic closing receptacles for clean and oily waste, as required by the insurance rules.

No.	Dimensions	Suitable for Lathe Tool Sets	Approx. Weight Pounds	Price Each	No.
0-1	18 x 16 x 34	Nos. 0 and 1	105	$45.00	0-1
2-3	21 x 19 x 34	Nos. 2 and 3	120	50.00	2-3
4-5	24 x 22 x 34	Nos. 4 and 5	143	57.50	4-5

ARMSTRONG SAFETY DRILL HOLDER

Patented



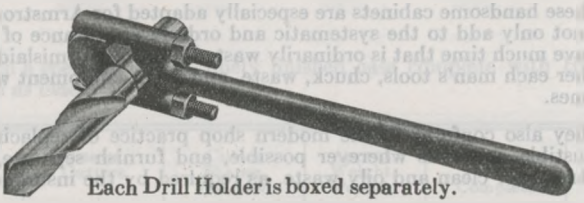
This holder furnishes the simplest, safest and most efficient means for holding taper shank drills when using them on the lathe. Its use will eliminate 90 per cent of drill breakage in such work, mutilation of drill shanks and sockets and injury to the operator. Each Drill Holder is boxed separately.

No.	Size Shank Morse Taper	Holds Drills	Approx. Weight Each Pounds	Price Each	No.
1	No. 1	1/16 to 9/16	1½	$1.80	1
2	No. 2	37/64 to 29/32	2	2.25	2
3	No. 3	59/64 to 1¼	4	3.00	3
4	No. 4	1 17/64 to 2	7	4.85	4
5	No. 5	2 1/64 to 3	14½	9.00	5

Armstrong "U" Clamp Drill Holder

Patented

This tool is designed for use in holding Straight Shank Drills, Reamers or similar tools, with safety to the operator and without danger of injury to the tool held.



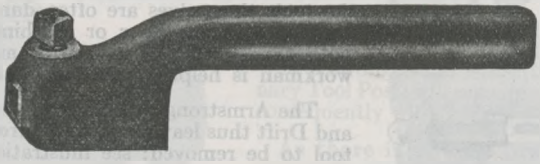
Each Drill Holder is boxed separately.

No.	Capacity	Length	Approx. Weight Each Pounds	Each	No.
200	3/8 to 1	11	2¼	$2.70	200
300	5/8 to 1½	13	4	3.60	300
400	7/8 to 2	15½	7	5.85	400
500	1¼ to 3	18	13¾	8.65	500

ARMSTRONG GRINDING HOLDERS

Grinding Holders are convenient and inexpensive.

Tool Holders are frequently ruined by workmen holding cutters in them while grinding or sharpening and this wasteful practice can be corrected by the use of these Grinding Holders.



No.	Holds Cutters	Approx. Weight Each Pounds	Price Each	No.
1-G	3/16 and 1/4 inch square	1	$ .90	1-G
2-G	5/16 and 3/8 inch square	1 1/2	1.20	2-G
3-G	7/16 and 1/2 inch square	2 1/4	1.50	3-G
4-G	5/8 and 3/4 inch square	3 1/2	2.25	4-G

PLAIN DRILL DRIFTS

These Drifts are Drop Forged from Steel, Finished and Hardened

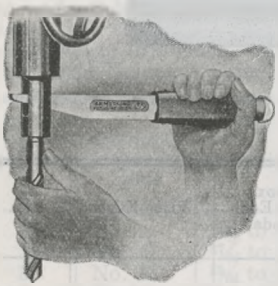
No.	Length	Fitting	Approx. Weight Each Pounds	Price Each	No.
1	5	No. 1 Sockets and Sleeves	1/8	$0.45	1
2	6	" 2 " " "	1/4	.50	2
3	7	" 3 " " "	1/2	.60	3
4	8 1/2	" 4, 5 & 6 " "	1	.75	4

ARMSTRONG SAFETY DRILL DRIFT

Patented

Automatic — Convenient — Effective

Serious injury to workmen is liable to result from the use of the common Drift and Hammer through heavy Chucks, Drills, etc., falling on the operators feet and the tools themselves are often damaged by rough contact with the floor or machine table; having both hands occupied with Drift and Hammer the workman is helpless and must take chances.



SAFETY FIRST
This Drill won't fall on the operator's foot.

The Armstrong Safety Drift combines Hammer and Drift thus leaving one hand free to support the tool to be removed: see illustration.

The heavy handle or driver is slidably mounted upon the blade, which is automatically kept extended, when not in operation, by a low tension coil spring.

In operating, the point of the blade is inserted in the slot of drill socket and the handle driven forcibly up the blade, until it strikes the butt end of drift—it will strike a blow sufficiently heavy to remove the most stubborn drill. One of these drifts attached to each drill press will soon save enough time to repay its cost many times.

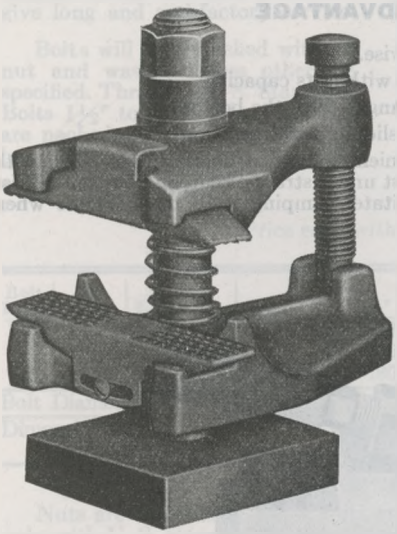
Each Drill Drift is boxed separately.

No.	Capacity Morse Taper	Recommended For	Approx. Weight Each Pounds	Extra Blades Each	Price Each Complete	No.
1-A	No. 1, 2 or 3	No. 1 or 2	1½	$1.20	$3.00	1-A
2-A	No. 2, 3 or 4	No. 2 or 3	2½	1.50	3.75	2-A
3-A	No. 3, 4 or 5	No. 3 or 4	3¾	2.10	5.25	3-A
4-A	No. 4, 5 or 6	No. 4 or 5	6	2.70	6.75	4-A

ARMSTRONG IMPROVED LATHE TOOL POST

Patented

This Tool Post combines the strength and holding power of the strap and stud tool clamp with the convenience of the "open side" and ordinary Set Screw Tool Post.



POINTS OF SUPERIORITY

It is stronger and stiffer than the ordinary Tool Post; will not slip or chatter and consequently will do more accurate work.

As there is no side projection it is peculiarly adapted to working close up to the chuck.

It has a great range of adjustment without loss of holding power as the rocker jaws adjust themselves on parallel lines.

The Open Side design permits rapid and convenient change and adjustment of tools.

It will not cut or tear the tool shank, and is therefore peculiarly adapted to use in connection with Tool Holders. The Body Parts and Jaws are Drop Forged of Steel-hardened, and other parts are Bar Steel.

Each Tool Post is boxed separately and price includes Wrench.

No.	For Tools Size	For Lathes	Approx. Weight Each Pounds	Price Each	No.
1-T	½x1⅛ inch and less	12 to 14 in. swing	5	$ 8.25	1-T
2-T	⅝x1⅜ and ¾x1⅝	16 to 18 "	8½	10.50	2-T
3-T	¾x1¾ and ⅞x1¾	20 to 22 "	11½	13.50	3-T
4-T	⅞x1¾ and 1x2	24 to 32 "	18	18.00	4-T

NOTE—Bolt Head and base forging are made large enough to allow for fitting. This is made necessary by the variation in size of T Slots and center heights in lathes of different manufacture.

FITTING—An extra charge of $2.00 net will be made for fitting tool post to individual lathe dimensions.

ARMSTRONG QUICK ACTION DRILL VISE

Patented

An Extremely Handy Vise for Tool Makers and General Machine Shop Use

POINTS OF ADVANTAGE

One turn of handle sets or releases the vise.

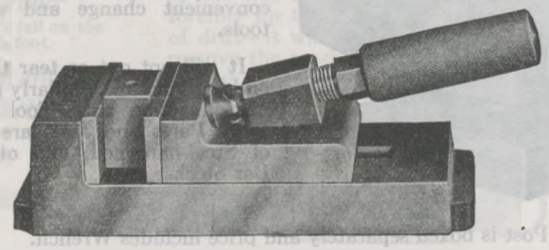
It can be instantly adjusted to any size within its capacity.

The sides are ground true and at right angles with the bottom.

It will hold work true and solid, as the sliding jaw draws down.

The handle provides a safe and convenient means of holding light work with ample leverage against the tendency to twist under strain of cut, and bottom of vise has projecting lugs at either end to facilitate clamping it to the machine when desirable.

Each Vise is boxed separately.

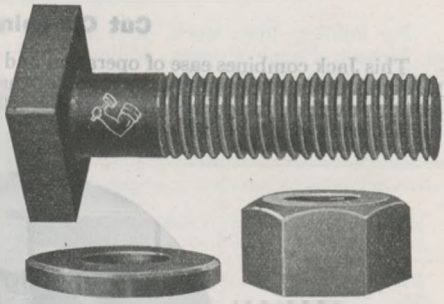


No.	Capacity			Approx. Weight Each Pounds	Price Each	No.
	Width of Jaw	Depth of Jaw	Opens			
1-V	2	15/16	1¾	4½	$13.50	1-V
2-V	2¾	1 3/16	2½	8½	18.00	2-V
3-V	3½	1 3/16	3	16	24.00	3-V

ARMSTRONG "T" SLOT BOLTS

Standard machine table "T" Slot Bolts. Accurately machined from high tensile steel and heat treated, these "T" Slot Bolts will give long and satisfactory service.

Bolts will be furnished without nut and washer unless otherwise specified. Thread is U. S. Standard. Bolts 1½" to 6" lengths inclusive, are packed one doz. of a size in a box.



Price each without Nut or Washer.

Bolt Diam	Lgth.	1½"	2"	2½"	3"	3½"	4"	4½"	5"	5½"	6"	8"	10"	12"
½"	Price	$0.30	$0.30	$0.30	$0.35	$0.38	$0.40	$0.45	$0.47	$0.50	$0.55	$0.95	$1.25	$1.75
⅝"	Price	.35	.35	.35	.45	.55	.60	.65	.70	.75	.80	1.25	1.70	2.15
¾"	Price	....	....	.70	.75	.80	.85	.90	.95	1.00	1.05	1.80	2.55	3.30
Bolt Diameter ...		½"					⅝"				¾"			
Dimensions of Head.....		⅞" sq. x ¼"					1 1/16" sq. x 5/16"				1 3/16" sq. x 7/16"			

NUTS

Nuts are extra thick, made from special steel, heat treated. Nuts are furnished only with U. S. standard threads. Packed one doz. of a size in a box.

Number	Bolt Diam.	Threads Per Inch	Thickness	Across Flats	Price Each
N-20	½"	13	7/16"	⅞"	$0.08
N-21	⅝"	11	¾"	1 1/16"	.14
N-22	¾"	10	⅞"	1¼"	.18

WASHERS

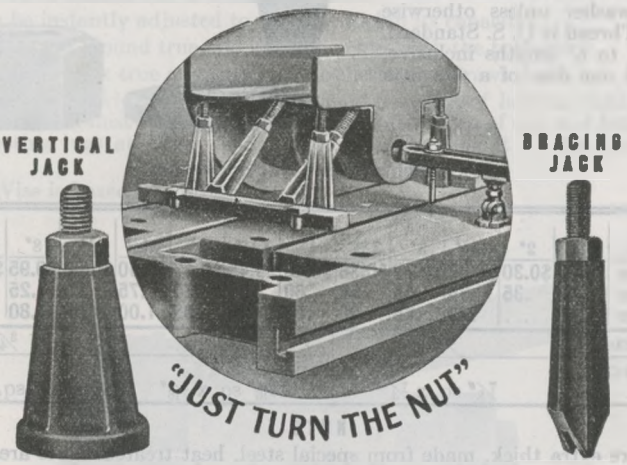
Heavy, extra thick washers, made from cold rolled bar stock. Case hardened. Hole diameter is 1/32 over bolt size. Packed one doz. in a box.

Number	Bolt Diameter	Outside Diam.	Thickness	Price Each
N-10	½"	1"	3/16"	$0.06
N-11	⅝"	1¼"	¼"	.07
N-12	¾"	1½"	¼"	.08

ARMSTRONG NON-SKID JACKS

Cut Clamping Costs

This Jack combines ease of operation and great power with an absolutely straight thrust as neither base nor screw revolves; the nut is the only part which turns. This design prevents "creeping" and permits setting the Jack under a fillet or sloping surface without danger of side slipping.



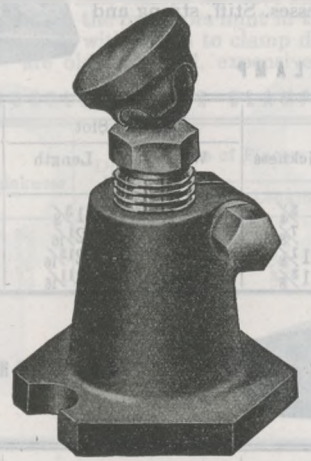
VERTICAL JACK

No.	Height Contracted	Height Extended	Diam. Screw	Approx. Weight Pounds	Price Each	No.
351	2¾	4	⅝	1½	$1.30	351
352	4	7¼	⅝	2	2.00	352
353	6¾	12	¾	5¼	3.00	353
354	8¾	15	1	7	4.50	354

BRACING JACK

361	3¾	6	⅝	1	$1.20	361
362	4¾	8	⅝	1½	1.85	362
363	6¾	12	¾	2¾	2.75	363
364	8¾	16	¾	4	3.75	364

ARMSTRONG PLANER JACK



These Jacks are designed to displace the haphazard devices and methods quite generally in use for leveling work on machine tools, and a glance will show any mechanic their convenience and utility. A set of them on a machine will greatly reduce the proportion of time required for preliminary arrangements as compared with the actual machine time on the job, and will, moreover, by their perfect adjustability and solidity, insure good, true surfaced work.

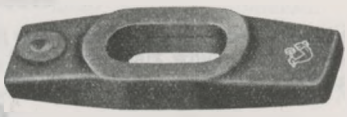
Each Jack is boxed separately.

No.	Height Contracted	Height Extended	Approx. Weight Each Pounds	Price Each	No.
1	2¾	3¾	1½	$1.90	1
2	3¾	5¼	3	3.00	2
3	5¼	7½	6	4.50	3
4	7½	12	12	8.65	4

ARMSTRONG MACHINE STRAP CLAMPS

Drop Forged Steel

For holding down work, dies, fixtures, etc., on Planers, Punch Presses, Milling Machines, Boring Mills and Drill Presses. Stiff, strong and convenient.



PLAIN CLAMP

No.	Lgth.	Width	Thickness	Size of Slot		Approx. Weight Each Pounds	Price Each	No.
				Width	Length			
54	4	1 5/8	3/4	11/16	1 3/8	1	$ .60	54
56	6	1 3/4	7/8	11/16	2 1/16	1 3/4	1.00	56
58	8	2 1/8	1 1/8	13/16	2 13/16	3 3/4	1.70	58
59	10	2 1/2	1 3/8	15/16	3 11/16	7	2.80	59

SCREW HEEL CLAMP

No.	Lgth.	Width	Thickness	Size of Slot		Approx. Weight Each Pounds	Price Each	No.
				Width	Length			
54-A	4	1 5/8	3/4	11/16	1 3/8	1 1/8	$1.10	54-A
56-A	6	1 3/4	7/8	11/16	2 1/16	2	1.70	56-A
58-A	8	2 1/8	1 1/8	13/16	2 13/16	4	2.60	58-A
59-A	10	2 1/2	1 3/8	15/16	3 11/16	7 1/4	4.00	59-A

GOOSE NECK CLAMP

No.	Length	Width	Thickness	Size of Slot		Offset Inches	Approx. Weight Each Pounds	Price Each	No.
				Width	Length				
74	4	1 5/8	3/4	11/16	15/16	13/16	1	$ .60	74
76	6	1 3/4	7/8	11/16	1 11/16	15/16	2	1.00	76
78	8	2 1/8	1 1/8	13/16	2 7/16	1 1/8	4 1/4	1.70	78

ARMSTRONG MACHINE STRAP CLAMPS

Drop Forged Steel

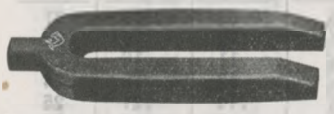
These clamps will save machines from standing idle while the operators hunt in the junk pile for a piece of scrap with which to clamp down a job Such methods are old fashioned, expensive and unsafe.

DOUBLE FINGER CLAMP

No.	Length	Width	Thickness	Diam. Hole Inches	Size of Fingers		Approx. Weight Each Pounds	Price Each	No.
					Diam.	Length			
30	3	1 1/2	5/8	11/16	1/2	1/2	3/8	$0.40	30
35	3 1/2	1 5/8	3/4	11/16	5/8	5/8	5/8	.50	35
40	4	1 13/16	7/8	13/16	3/4	3/4	7/8	.70	40

FINGER CLAMP

No.	Lgth.	Width	Thickness	Size of Slot		Size of Finger		Approx. Weight Each Pounds	Price Each	No.
				Width	Lgth.	Diam.	Lgth.			
44	4	1 3/8	3/4	11/16	1 3/8	1/2	1/2	3/4	$ .60	44
46	6	1 3/4	7/8	11/16	1 15/16	5/8	5/8	1 1/2	1.00	46
48	8	2 1/8	1 1/8	13/16	2 9/16	3/4	3/4	3	1.70	48



"U" CLAMP

No.	Lgth.	Width	Thickness	Size of Slot		Size of Finger		Approx. Weight Each Pounds	Price Each	No.
				Width	Lgth.	Diam.	Lgth.			
64	4	1 3/4	3/4	11/16	3 1/2	9/16	9/16	1	$ .60	64
66	6	2	7/8	11/16	5 1/2	11/16	11/16	2	1.00	66
68	8	2 3/8	1 1/8	13/16	7 3/8	13/16	13/16	4	1.70	68
110	10	2 3/4	1 1/4	15/16	9	15/16	15/16	6 1/2	2.50	110
112	12	3 1/4	1 3/4	1 1/16	11	1 1/16	1 1/16	11	3.70	112

ARMSTRONG DROP FORGED EYE BOLTS

With and Without Shoulder — Blank or Threaded

Armstrong Eye Bolts are of strong, uniform design, drop forged from the best mild steel and are treated to give increased tensile strength.

When ordering specify whether Blank or Threaded Eye-Bolts are wanted. Blank Eye Bolts will be shipped unless Threaded is specified.

No. Without Shoulder	Size of Shank		Size of Eye		Capacity Tons Safe Working Load; Blank	Approx. Weight Each Pounds	Price Each		No. With Shoulder
	Diam.	Lgth.	Inside Diam.	Outside Diam.			Blank	Threaded U. S. Std.	
—	1/4	1	3/4	1 3/16	1/5	1/16	$0.09	$0.14	21
—	5/16	1 1/8	7/8	1 7/16	2/5	1/10	.10	.15	22
3	3/8	1 1/4	1	1 21/32	5/8	1/6	.11	.16	23
4	7/16	1 3/8	1 3/32	1 27/32	1	1/5	.12	.18	24
5	1/2	1 1/2	1 5/16	2 1/16	1 1/4	1/4	.14	.21	25
6	9/16	1 5/8	1 9/32	2 9/32	1 1/2	2/5	.17	.25	26
7	5/8	1 3/4	1 3/8	2 1/2	2	5/8	.22	.32	27
8	3/4	2	1 1/2	2 13/16	3	1	.30	.42	28
9	7/8	2 1/4	1 11/16	3 1/4	3 1/2	1 1/8	.40	.55	29
10	1	2 1/2	1 13/16	3 9/16	4	2	.55	.74	30
11	1 1/8	2 3/4	2	4	5	2 3/4	.80	1.04	31
12	1 1/4	3	2 3/16	4 7/16	7 1/2	3 1/2	1.15	1.45	32
14	1 1/2	3 1/2	2 1/2	5 5/16	9	6	2.00	2.50	34

*Eyebolts with shoulder are measured under shoulder. Extra lengths can be furnished; prices on same will be quoted upon application.

BENT TAIL LATHE DOGS

With Either Square Head Screw or Safety Headless Screw
Drop Forged Steel

With Square Head Screw

The design as well as the quality of material and workmanship in these lathe dogs is unexcelled. They are forged from a special grade of open hearth steel which is tough, and at the same time possesses the stiffness which is essential in a good lathe dog. The hubs are large enough to permit of retapping. The screws are made from alloy steel with U. S. Standard thread and are hardened on the point, the improved shape of which also renders them less liable to "flange" or upset.

With Headless Screw

Number		Capacity	Approx. Weight Each Pounds	Wrench for Headless Screw Each Extra	Extra Screws Each		
With Square Head Screw	With Headless Screw				Square Head	Headless	Each Complete*
1	1-H	⅜	¼	$0.12	$0.20	$0.20	$1.00
2	2-H	½	⅜	.14	.22	.24	1.10
3	3-H	¾	½	.16	.24	.30	1.20
4	4-H	1	¾	.18	.28	.36	1.40
5	5-H	1¼	1½	.18	.30	.42	1.70
6	6-H	1½	2	.18	.38	.50	2.00
7	7-H	1¾	2¾	.26	.44	.60	2.40
8	8-H	2	3½	.26	.52	.72	2.80
9	9-H	2½	5¼	.38	.66	.86	3.60
10	10-H	3	6¾	.38	.72	.86	4.60
11	11-H	3½	9	.60	1.00	1.16	6.00
12	12-H	4	12	.60	1.10	1.16	9.00
13	13-H	5	18	.90	1.50	1.50	16.00
14	14-H	6	24	.90	1.60	1.50	24.00

*Price does not include Wrench. When ordering Dogs with Headless Screws specify whether Wrenches are wanted or not and if wanted how many. When not otherwise specified one Wrench for each size Dog ordered will be shipped and charged for. Dogs with Square Head Screws will be shipped when not otherwise specified

STRAIGHT TAIL LATHE DOGS

With Either Square Head Screw or Safety Headless Screw
Drop Forged Steel

With Square Head Screw

With Headless Screw

Number		Capacity	Approx. Weight Each Pounds	Wrench for Headless Screw Each Extra	Extra Screws Each		Price Each Complete*
With Square Head Screw	With Headless Screw				Square Head	Headless	
21	21-H	3/8	1/4	$0.12	$0.20	$0.20	$1.00
22	22-H	1/2	1/4	.14	.22	.24	1.10
23	23-H	3/4	1/2	.16	.24	.30	1.20
24	24-H	1	3/4	.18	.28	.36	1.40
25	25-H	1 1/4	1 1/4	.18	.30	.42	1.70
26	26-H	1 1/2	2	.18	.38	.50	2.00
27	27-H	1 3/4	2 1/2	.26	.44	.60	2.40
28	28-H	2	3 1/4	.26	.52	.72	2.80
29	29-H	2 1/2	4 3/4	.38	.66	.86	3.60
30	30-H	3	6 3/4	.38	.72	.86	4.60
31	31-H	3 1/2	8	.60	1.00	1.16	6.00
32	32-H	4	11	.60	1.10	1.16	9.00
33	33-H	5	17	.90	1.50	1.50	16.00
34	34-H	6	22	.90	1.60	1.50	24.00

*Price does not include Wrench. When ordering Dogs with Headless Screws specify whether Wrenches are wanted or not and if wanted how many. When not otherwise specified one Wrench for each size Dog ordered will be shipped and charged for. Dogs with Square Head Screws will be shipped when not otherwise specified.

ARMSTRONG SAFETY LATHE DOG

Patented

Bent Tail

Drop Forged Steel

This lathe dog combines the convenience and efficiency of the common lathe dog with a perfect shield for the set screw head.

No special wrench is needed and the extra leverage provided by the safety cap makes the adjustment of the set screw by hand easy and fast. The interior of safety cap is shaped to conform to the head of set screw so that when the cap is turned the set screw turns with it, the head of screw slipping up or down inside the safety cap.

Number Bent Tail	Capacity	Weight Each Pound	Price Each
1-A	3/8	3/8	$1.80
2-A	1/2	1/2	1.90
3-A	3/4	5/8	2.00
4-A	1	1	2.30
5-A	1 1/4	1 3/4	2.80
6-A	1 1/2	2 1/4	3.40
7-A	1 3/4	2 3/4	4.00
8-A	2	3 3/4	4.80
9-A	2 1/2	5 1/2	6.00
10-A	3	7	7.60

HEAVY DUTY LATHE DOGS

With Either Square Head Screws or Headless Screws
Drop Forged Steel

With Square Head Screws

Bent Tail, Double Screw

With Safety Headless Screws

These Bent Tail, Heavy Duty Lathe Dogs are drop forged from steel, selected for its high degree of stiffness, combined with great tensile strength, which qualities are further improved by careful treatment.

The Screws are of the special quality used in all Armstrong Dogs, and are made from chrome nickel alloy steel, with U. S. Standard Thread; points are hardened.

Number		Capacity	Approx. Weight Each Pounds	Wrench for Headless Screw Each Extra	Extra Screws Each		Price Each Complete*
With Square Head Screws	With Headless Screws				Square Head	Headless	
112	112-H	4	15	$0.74	$1.10	$1.16	$16.00
113	113-H	5	21	.90	1.50	1.50	24.00
114	114-H	6	29	1.10	1.60	1.50	34.00

Dogs with Square Head Screws will be shipped when not otherwise specified.
*Price does not include Wrench. When ordering Dogs with Headless Screws specify whether Wrenches are wanted or not and, if wanted, how many. When not otherwise specified one Wrench for each size Dog ordered will be shipped and charged for.

HEAVY DUTY LATHE DOGS

With Either Square Head Screws or Safety Headless Screws
Drop Forged Steel

With Square Head Screws

Straight Tail Double Screw

With Headless Screws

Our Heavy Duty Dogs embody the proportions and quality of material needed to meet the demands of modern high powered lathes and High Speed Tool Steel and have been expressly designed to meet the extreme requirements of High Speeds and Heavy Feeds.

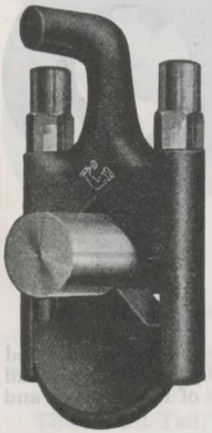
Number		Capacity	Approx. Weight Each Pounds	Wrench for Headless Screw Each Extra	Extra Screws Each		Price Each Complete
With Square Head Screws	With Headless Screws				Square Head	Headless	
128	128-H	2	5	$0.26	$0.52	$0.72	$5.50
129	129-H	2½	6¾	.38	.66	.86	7.00
130	130-H	3	8¾	.38	.72	.86	9.00
131	131-H	3½	12½	.60	1.00	1.16	12.00
132	132-H	4	15	.60	1.10	1.16	16.00
133	133-H	5	21	.90	1.50	1.50	24.00
134	134-H	6	29	.90	1.60	1.50	34.00
135	135-H	7	37	1.30	2.30	1.80	46.00
136	136-H	8	50	1.50	2.60	1.80	56.00

*Price does not include Wrench. When ordering Dogs with Headless Screws specify whether Wrenches are wanted or not and, if wanted, how many. When not otherwise specified one Wrench for each size Dog ordered will be shipped and charged for. Dogs with Square Head Screws will be shipped when not otherwise specified.

ARMSTRONG SAFETY CLAMP LATHE DOG

Patented

Practical, Safe and Well Balanced

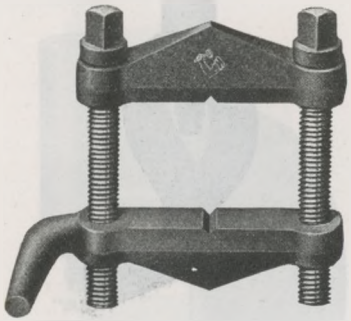


This Dog is so constructed as to combine a wide range of adjustment with the convenient features of the clamp dog and the simplicity and strength of the ordinary lathe dog. It will accommodate itself readily to work of any shape and will hold it securely and squarely, being especially adapted for use on finished work which would be liable to be damaged by the set screw of a common lathe dog. The sliding jaw is operated by a loose fitting U bolt, the ends of which are protected by SAFETY Sleeve Nuts and can be adjusted to size very quickly, only a wrench being necessary to tighten. One advantage of this dog is that it can be applied without removing work from centers. Each Dog is boxed separately.

No.	Capacity	Approx. Weight Each Pounds	Price Each	No.
1-U	⅛ to ⅝	⅝	$ 2.40	1-U
2-U	⅜ to 1	1¾	3.00	2-U
3-U	⅝ to 1½	3	4.00	3-U
4-U	⅞ to 2	4½	5.50	4-U
5-U	1¼ to 3	9½	8.00	5-U
6-U	1¾ to 4	16	12.00	6-U
7-U	2½ to 5	21	16.00	7-U

ARMSTRONG CLAMP LATHE DOGS

Drop Forged Steel

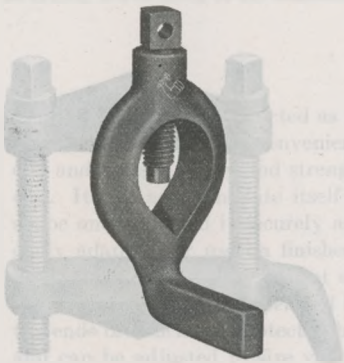


The under face of screw heads is convex, fitting into a concave seat, and as the holes in upper bar are larger than the screw, this allows for considerable tilting without bending the screws. The clamp bars are forged from a stiff, open hearth steel, carefully machined and hardened. Screws are hardened. Each Dog is boxed separately.

No.	Capacity Between Screws	Approx. Weight Each Pounds	Extra Screws Each	Price Each Complete	No.
11	1¾	⅝	$0.20	$3.00	11
12	2¼	1	.30	4.00	12
13	2¾	1¾	.40	5.00	13
14	3½	2¾	.60	7.00	14

MILLING MACHINE DOGS

Drop Forged Steel



These dogs are recommended for use on taper work carried between centers on milling machines.

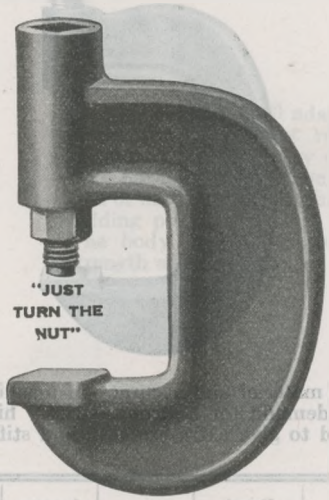
The flat tail engages the head-slot without the back-lash produced by taper tail dogs.

The hubs are large enough to permit re-tapping. The screws are made from alloy steel with U. S. Standard thread and are hardened on the point, the improved shape of which also renders them less liable to flange or upset.

No.	Capacity	Approx. Weight Each Pounds	Extra Screws Each	Price Each Complete	No.
42	½	¾	$0.22	$1.10	42
43	¾	⅞	.24	1.20	43
44	1	1	.28	1.40	44
45	1¼	1¼	.30	1.70	45
46	1½	1½	.38	2.00	46
47	1¾	1⅝	.44	2.40	47
48	2	2	.52	2.80	48

ARMSTRONG NON-SKID "C" CLAMPS

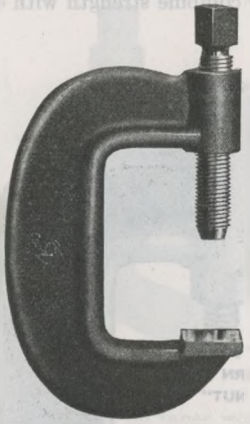
This clamp can be quickly and solidly set on straight, sloping or irregular surfaces without creeping of screw or shifting of the work as the screw or ram does not revolve and will hold the exact position in which it is set. The body of the clamp is malleable iron and is so designed as to combine strength with convenient weight.



No.	Capacity		Depth Center of Screw to Back	Diam. of Screw	Weight Pounds	Extra Screws Each	Price Each Complete	No.
	Max.	Min.						
111	1½	⅜	1½	½	2	$0.60	$2.50	111
113	3	1¼	2½	¾	6¼	1.20	5.00	113
114	4	1½	3	¾	8½	1.40	6.50	114
116	6	1¾	3¾	⅞	18	1.60	10.00	116
118	8	2½	4½	1	30	2.00	14.00	118

ARMSTRONG "C" CLAMPS

Heavy Design with Long Hub
Extra Large Alloy Steel Screw
Drop Forged Steel



In design, quality of material and accuracy of machining, our "C" Clamps in every respect meet the demand for a strong, strictly high grade, reliable clamp. The body is heat treated to give extra strength and stiffness.

No.	Capacity		Depth Center of Screw to Back	Diam. of Screw	Approx. Weight Each Pounds	Extra Screws Each	Price Each Complete	No.
	Max.	Min.						
9	3/4	0	3/4	3/8	1/2	$0.20	$ 1.00	9
10	1 1/4	0	1 1/8	7/16	3/4	.24	1.50	10
11	1 3/4	0	1 1/2	9/16	1 3/4	.28	2.50	11
12	2 1/4	7/8	1 7/8	11/16	3 1/2	.40	3.50	12
13	3 1/4	1 1/4	2 1/4	13/16	6	.56	5.00	13
14	4 1/2	1 3/4	2 3/4	15/16	10	.76	6.50	14
15	5 1/2	2 1/2	3 1/4	1	13 1/2	1.00	8.00	15
16	6 1/2	3 1/4	3 1/2	1 1/8	18 1/2	1.30	10.00	16
18	8 1/2	4 1/2	3 3/4	1 1/4	25	1.70	14.00	18
20	10 1/2	6	3 7/8	1 1/4	30	1.70	19.00	20
22	12 1/2	7 1/2	4	1 1/4	32	2.40	25.00	22

NOTE—Heavy "C" clamps Nos. 12 to 22 can be furnished with full length screws when specified at special prices. With full length screws the minimum capacity of all clamps is 0.

ARMSTRONG "C" CLAMPS

Drop Forged Steel — For Medium Service

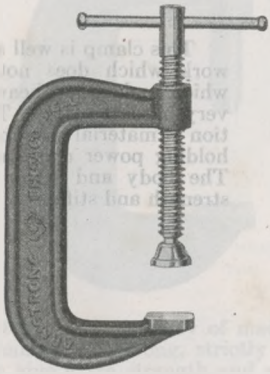
This clamp is well adapted to that wide field of work which does not require the extra weight which makes our heavy clamp unequalled for the very hardest service. The design and careful selection of material used in this clamp assure maximum holding power consistent with convenient weight. The body and screw are heat treated for extra strength and stiffness.

No.	Capacity		Depth Center of Screw to Back	Diam. of Screw	Approx. Weight Each Pounds	Extra Screws with Handle and Swivel Each	Price Each Complete	No.
	Max.	Min.						
0	2	0	1½	½	1¼	$1.00	$ 3.50	0
1	3	0	2	⅝	2½	1.20	4.00	1
2	4	0	2⅜	¾	4	1.40	4.50	2
3	6	3	2½	¾	6	1.40	5.50	3
4	8	4	2⅝	¾	7¼	1.40	6.50	4
5	10	6	2¾	¾	8½	1.40	7.50	5
6	12	8	2⅞	⅞	11½	1.40	8.50	6
7	15	10	3 1/16	⅞	14	2.40	11.00	7
8	18	12	3¼	⅞	18	2.40	14.00	8

ARMSTRONG "C" CLAMPS

Drop Forged Steel — For Light Service

This is a light, strong clamp; just what is needed in assembling automobile bodies, boats and all kinds of light framework. The body is drop forged from special steel and heat treated to give extra strength and stiffness.



No.	Capacity		Depth Center of Screw to Back	Diam. of Screw	Approx. Weight Each Pounds	Extra Screws with Handle and Swivel, Each	Price Each Complete	No.
	Max.	Min.						
502	2	0	1¾	½	¾	$0.60	$1.50	502
503	3	0	2	½	1¼	.70	1.80	503
504	4	0	2⅜	⅝	2	.80	2.20	504
506	6	0	3	⅝	3	1.00	3.00	506
508	8	1½	3⅜	¾	4½	1.20	4.00	508
510	10	2½	3¾	¾	6	1.50	5.00	510
512	12	3½	4	13/16	7½	2.00	6.50	512

ARMSTRONG "C" CLAMPS

Drop Forged Steel — Extra Deep Throat

This clamp is designed with extra deep throat for maximum clearance required by body-builders, woodworkers and allied trades.

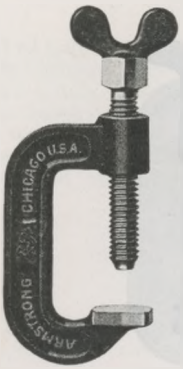
The body is drop forged from special steel and heat treated for strength and stiffness.

No.	Capacity Max.	Capacity Min.	Depth Center of Screw to Back	Diam. of Screw	Approx. Weight Each Pounds	Extra Screws with Swivel Each	Price Each Complete	No.
402	2	0	2	1/2	1 1/8	$0.60	$1.50	402
403	3	0	2 3/8	1/2	1 1/2	.70	1.80	403
404	4	0	2 3/4	5/8	2 1/4	.80	2.20	404
406	6	0	3 5/8	5/8	3 3/4	1.00	3.00	406
408	8	2	4 1/2	3/4	5 1/2	1.20	4.00	408
410	10	3	5 3/8	3/4	8 1/4	1.50	5.00	410
412	12	4	5 3/4	7/8	12 1/2	2.00	6.50	412

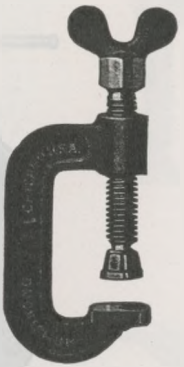
ARMSTRONG TOOL MAKERS' "C" CLAMPS

Drop Forged Steel

These clamps are forged from a selected grade of steel and heat treated to increase the natural toughness and strength of the material. The screws, which are also drop forged have a square neck which is convenient for using a wrench to set up tightly.



WITH PLAIN SCREW



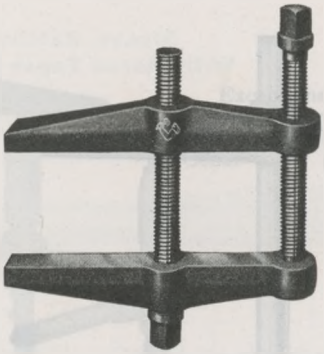
WITH SWIVEL SCREW

Each clamp is boxed separately. Clamps with Swivel Screw will be furnished unless otherwise specified.

No.	Capacity		Depth. Center of Screw to Back	Diam. of Screw	Approx. Weight Pounds	Extra Screws with Swivel Cap Each	Price Each with Plain Screw	Price Each Complete with Swivel Screw	No.
	Max.	Min.							
301	1	0	11/16	5/16	1/3	$0.90	$1.00	$1.50	301
302	2	0	13/16	3/8	1/4	1.00	1.30	1.80	302
303	3	1	15/16	3/8	5/8	1.20	1.70	2.30	303
304	4	1 1/4	1 1/8	7/16	1	1.60	2.50	3.20	304

ARMSTRONG MACHINIST'S CLAMPS

Drop Forged Steel



These clamps are forged from a stiff, open hearth steel, carefully machined and hardened. The under face of center screw is convex, fitting into a concave seat to allow for tilting. Jaws are extra heavy, will not bend or spring on a short bite and are faced true. Screws are hardened. Each clamp is boxed separately.

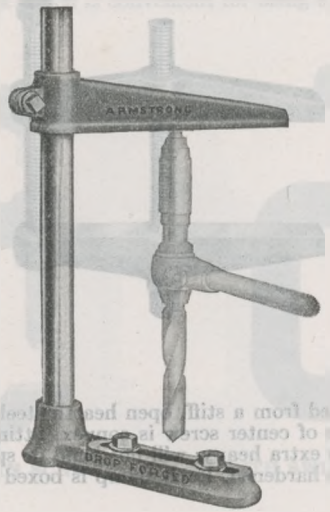
No.	Capacity	Approx. Weight Each Pounds	Extra Screws Each	Price Each Complete	No.
1	Opens to 1¼ in.	¾	$0.20	$3.00	1
2	Opens to 2¼ in.	1	.24	4.00	2
3	Opens to 3¼ in.	1¾	.30	5.00	3
4	Opens to 4¼ in.	2¾	.40	6.00	4

In ordering extra screws it is necessary to specify whether center or heel screw is wanted.

ARMSTRONG DRILLING POST

(Old Man)

For Use with Ratchet Drills — Drop Forged Steel

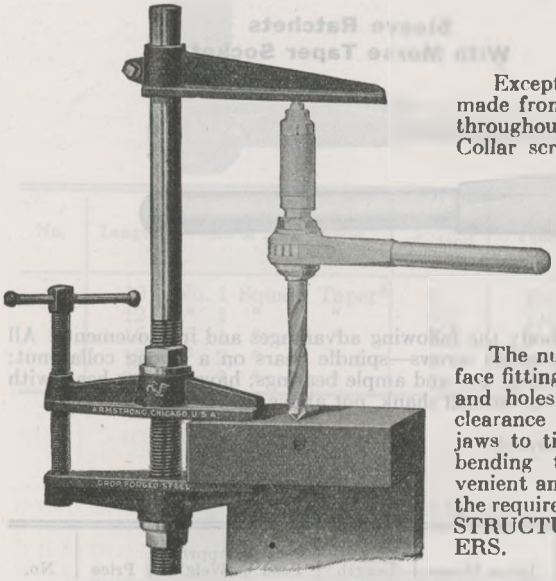


Foot and Arm are Drop Forged. The finished steel post is screwed into foot and can be easily removed for packing in tool kit. Each Drilling Post is boxed separately.

No.	Height of Post	Diameter of Post	Arm Radius	Approx. Weight Each Pounds	Price Each	No.
8	16	1	8	9	$ 6.00	8
10	20	1¼	10	16	8.00	10
12	26	1½	12	30	10.00	12

ARMSTRONG ADJUSTABLE CLAMP DRILLING POST

Drop Forged Steel



Exceptionally well designed and made from drop forged and bar steel throughout, with alloy steel heel screw. Collar screw and nuts are hardened.

The nuts have convex bearing surface fitting concave seat in clamp jaws and holes through jaws have ample clearance thus permitting the clamp jaws to tilt freely without danger of bending the post. Especially convenient and well adapted to meet the requirements of BRIDGE and STRUCTURAL IRON WORKERS.

Each Drilling Post is boxed separately.

No.	Height of Post	Diam. of Post	Arm Radius	Capacity Clamp	Approx. Weight Each Pounds	Price Each	No.
C- 8	16	1	8	4	16	$ 8.50	C- 8
C-10	20	1¼	10	4½	27	11.00	C-10
C-12	26	1½	12	5	42	15.00	C-12

ARMSTRONG IMPROVED PACKER RATCHET DRILLS

Sleeve Ratchets With Morse Taper Socket

Our Packer Ratchets embody the following advantages and improvements: All parts are steel, hardened; no small screws—spindle bears on a strong collar nut; extra strong teeth and pawl, large key and ample bearings; have shorter head with full length feed; the pawl drives on drill shank, not above it.

Each Rachet is boxed separately.

No.	Length	Size of Drill Socket	Takes Morse Taper Drill	Length of Head	Feed	Approx. Weight Each Pounds	Price Each	No.
1-M	10	No. 2 Morse	37/64 to 29/32	6	2¼	4	$ 8.75	1-M
2-M	12	No. 3 "	59/64 to 1¼	6¾	2½	6	11.00	2-M
3-M	15	No. 3 "	59/64 to 1¼	7¾	3	8	13.50	3-M
4-M	18	No. 4 "	1 17/64 to 2	9	3½	12	17.00	4-M
5-M	21	No. 4 "	1 17/64 to 2	9¾	4	15	21.00	5-M
6-M	30	No. 5 "	2 1/64 to 3	12½	4½	35	53.00	6-M

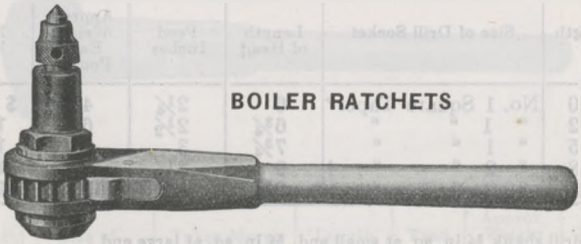
Packer Ratchets with Morse Taper Sockets can be made to take smaller sized drills, and drills with square taper and blacksmiths' shank.

NOTE—Also made with railroad pattern Hexagon Feed Sleeve (except No. 6-M), same price as above, see page 100.

ARMSTRONG IMPROVED PACKER RATCHET DRILLS

Sleeve Ratchets with Square Taper Socket

No.	Length	Size of Drill Socket	Length of Head	Feed	Approx. Weight Each Pounds	Price Each	No.
1	10	No. 1 Square Taper*	6	2¼	4	$ 8.75	1
2	12	" 1 " "	6¾	2½	6	11.00	2
3	15	" 1 " "	7¾	3	8¾	13.50	3
4	18	" 2 " " †	9	3½	12	17.00	4
5	21	" 2 " "	9¾	4	16	21.00	5

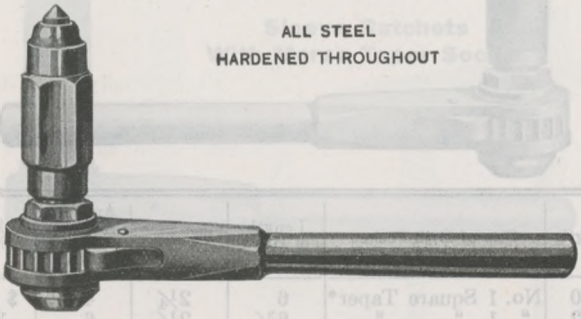


BOILER RATCHETS

No.	Length	Size of Drill Socket	Length of Head	Feed	Approx. Weight Each Pounds	Price Each	No.
1-B	10	No. 1 Square Taper*	4⅜	1½	3¼	$ 7.50	1-B
2-B	12	" 1 " "	5	1¾	5	9.00	2-B
3-B	15	" 1 " "	5½	2	7½	11.00	3-B
4-B	18	" 2 " " †	6	2¼	10	12.75	4-B

*Taking drill shank ⅝ in. sq. at small end and ⅝ in. sq. at large end.
†Taking drill shank ½ in. sq. at small end and ¾ in. sq. at large end.
By means of sockets, these ratchets can be adapted to use of blacksmiths' drills with round shank.

ARMSTRONG "RAILROAD" PACKER RATCHET DRILLS



No.	Length	Size of Drill Socket	Length of Head	Feed Inches	Approx. Weight Each Pounds	Price Each	No.
1-R R	10	No. 1 Square Taper*	6	2¼	4	$ 8.75	1-R R
2-R R	12	" 1 " "	6¾	2½	6	11.00	2-R R
3-R R	15	" 1 " "	7¾	3	9	13.50	3-R R
4-R R	18	" 2 " " †	9	3½	12	17.00	4-R R
5-R R	21	" 2 " "	9¾	4	16	21.00	5-R R

*Taking drill shank ⅝ in. sq. at small end, ⅝ in. sq. at large end.

†Taking drill shank ½ in. sq. at small end, ¾ in. sq. at large end.

By means of sockets, these ratchets can be adapted to the use of blacksmiths' drills with round shank

Railroad Pattern Packer Ratchets for Morse Taper Shank Drills

We can furnish Railroad Ratchets with Morse Taper Sockets at prices listed on page 98. When ordering same, use regular catalog number, but specify "Railroad Pattern."

ARMSTRONG "STANDARD" REVERSIBLE RATCHET DRILLS

To meet the demand for a general service ratchet, we present to the trade our complete line of Standard Reversible Ratchet Drills, which for design, workmanship and wear resisting qualities we believe to be unequalled.

They are made of steel throughout and all parts are hardened with the exception of the handle, which is polished.

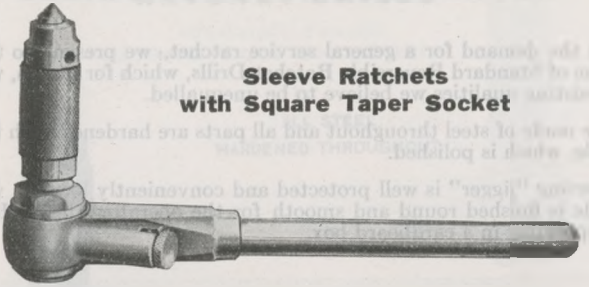
The reversing "jigger" is well protected and conveniently located, while the end of the handle is finished round and smooth for the operator's hand. Each Ratchet is packed separately in a cardboard box.

SLEEVE RATCHETS
WITH MORSE TAPER SOCKET

No.	Length	Size of Drill Socket	Takes Morse Taper Drills	Length of Head	Feed	Approx. Weight Each Pounds	Price Each	No.
9-M	9	No. 1 Morse	1/16 to 9/16	5	2	1¾	$ 7.50	9-M
12-M	12	No. 2 "	37/64 to 29/32	6	2¼	4	8.00	12-M
15-M	15	No. 3 "	59/64 to 1¼	6¾	2½	6¼	9.00	15-M
18-M	18	No. 3 "	59/64 to 1¼	7¾	3	9¼	10.50	18-M
22-M	22	No. 4 "	1 17/64 to 2	9	3½	13	12.00	22-M

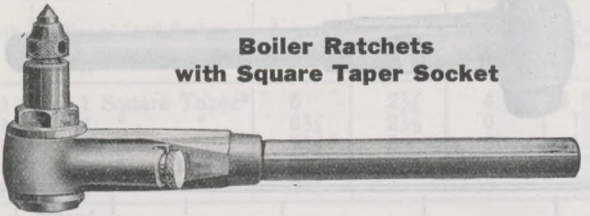
By means of sleeves and sockets, Standard Ratchets with Morse Taper Sockets can be made to take smaller drills, and drills with square taper and blacksmiths' shank.

ARMSTRONG "STANDARD" REVERSIBLE RATCHET DRILLS



Sleeve Ratchets with Square Taper Socket

No.	Length	Size of Drill Socket	Length of Head	Feed	Approx. Weight Each Pounds	Price Each	No.
9	9	St'd Bit Stock Taper	5	2	1¾	$ 7.25	9
12	12	No. 1 Square Taper*	6	2¼	4	7.50	12
15	15	" 1 " "	6¾	2½	6¼	8.75	15
18	18	" 1 " "	7¾	3	9½	10.00	18
22	22	" 2 " " †	9	3½	13½	11.50	22

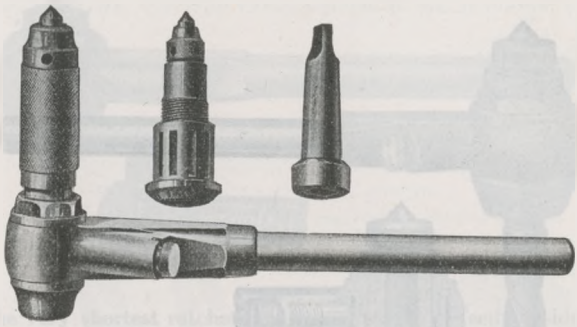


Boiler Ratchets with Square Taper Socket

No.	Length	Size of Drill Socket	Length of Head	Feed	Approx. Weight Each Pounds	Price Each	No.
9-B	9	St'd Bit Stock Taper	3¼	1⅛	1½	$ 6.75	9-B
12-B	12	No. 1 Square Taper*	4⅜	1½	3½	7.25	12-B
15-B	15	" 1 " "	5	1¾	5½	8.25	15-B
18-B	18	" 1 " "	5½	2	8	9.75	18-B
22-B	22	" 2 " " †	6	2¼	11½	11.25	22-B

*Taking drill shank ⅜ in. sq. at small end and ⅝ in. sq. at large end.
†Taking drill shank ½ in. sq. at small end and ¾ in. sq. at large end.
By means of sockets, these ratchets can be adapted to use of blacksmiths' drills with round shank.

ARMSTRONG "STANDARD" REVERSIBLE RATCHET DRILLS



Standard Ratchet Combination

The combination includes Sleeve Ratchet for Morse Taper Shank Drills, square taper socket to fit same and a short spindle with feed screw by means of which the Ratchet can be converted into a Boiler Ratchet or adapted to use square taper shank drills.

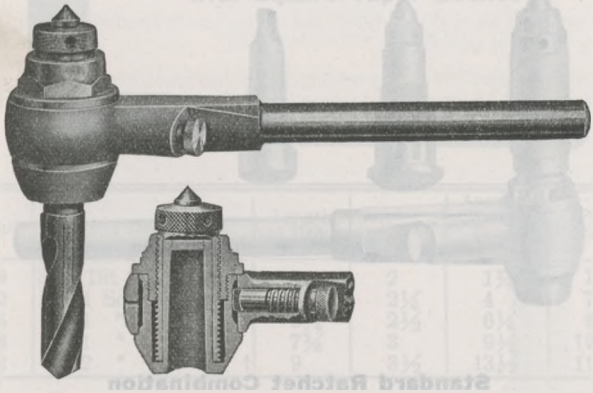
No.	Length	Size of Drill Sockets	Approx. Weight Each Pounds	Price Complete	No.
9-C	9	St'd Bit Stock and No. 1 Morse	2½	$11.25	9-C
12-C	12	No. 1 Square Taper and No. 2 Morse	5¼	11.50	12-C
15-C	15	No. 1 Square Taper and No. 3 Morse	8	13.50	15-C
18-C	18	No. 1 Square Taper and No. 3 Morse	12	16.00	18-C
22-C	22	No. 2 Square Taper and No. 4 Morse	17	17.25	22-C

ARMSTRONG SHORT RATCHET DRILL

Patented

For Drills with Morse Taper Shank

Short Head — Long Feed — Reversible



The Sectional View shows clearly the construction, which is simple, compact and strong. All parts are made from Drop Forgings or Bar Steel. Pawl and center are tool steel, carefully tempered. It is self-discharging and can be reversed instantly. Each Ratchet is boxed separately.

Number	Socket	Length	Length Head	Feed	Approx. Weight Each Pounds	Price Each	Number
62-R	No. 3 Morse	12	3¾	2½	6¾	$12.00	62-R
63-R	No. 3 Morse	18	3¾	2½	9	15.00	63-R

EXTRA SPINDLES

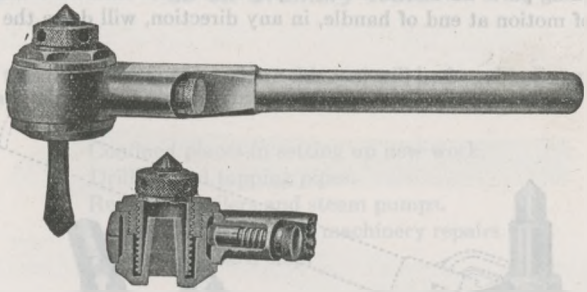
Spindle with Nut and Feed Screw, each.....$5.25

NOTE—Style A and E Spindles for Square Taper Shank Drills (see next page) are interchangeable with Style R. By means of Sleeves and Sockets, Style R Spindle can be adapted to take smaller sizes of Morse Taper Shank Drills and drills with Square Taper and Blacksmiths' Shanks.

ARMSTRONG SHORT RATCHET DRILL

Patented

For Drills with Square Taper Shank



This is the very shortest ratchet drill made, length of feed considered, and will be found extremely useful wherever holes have to be drilled in places where height of space is limited. Its short head, strength, compactness and quick reverse make it a perfect boiler ratchet. All parts are drop forged or made from bar steel. Pawl and center are tool steel, carefully tempered. Each Ratchet is boxed separately.

Number	Socket Square Taper	Length	Length Head	Feed	Approx. Weight Each Pounds	Price Each	Number
62-A	No. 1	12	2¾	1½	6	$12.00	62-A
62-E	" 2	12	2¾	1½	6	12.00	62-E
63-A	" 1	18	2¾	1½	8	15.00	63-A
63-E	" 2	18	2¾	1½	8	15.00	63-E

EXTRA SPINDLES

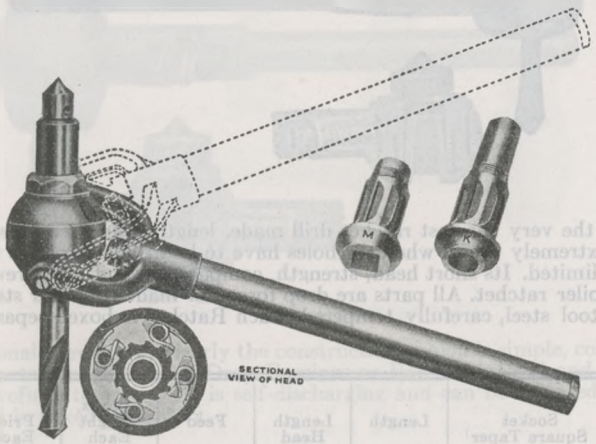
Spindle with Nut and Feed Screw, each $5.25

NOTE—Style R Spindles for Morse Taper Shank Drills (see page 104) are interchangeable with styles A and E. By means of sockets, this ratchet can be adapted to use of blacksmiths' drills with round shank.

ARMSTRONG UNIVERSAL RATCHET DRILL

Patented

Simple, strong—no ball joints or bevel gears. Made from drop forgings and bar steel. All working parts hardened. Drills 10 per cent faster than an ordinary ratchet. Two inches of motion at end of handle, in any direction, will drive the drill.



Description of the Mechanical Motion

The universal motion of the ratchet is due to the fact that the axis of the two trunnions on which the handle turns is at an acute angle with the axis of the drill. Set the fixing screw up into one of the three countersinks and you have a rigid handle, as in the common ratchet. In two of these fixed positions the handle stands at an angle out of the way of possible obstructions. In the No. 6 Ratchet there are twelve large teeth in the ratchet and five pawls, which engage one at a time. Thus the pawls catch sixty times in a revolution, decreasing lost motion 80 per cent.

ARMSTRONG UNIVERSAL RATCHET DRILL

Patented

For Use Where Other Ratchets are Useless as Well as on Ordinary Work

Some of the difficult situations where this tool will be found indispensable, paying for itself many times on a single job:

Confined places in setting up new work.
Drilling and tapping pipes.
Repairing boilers and steam pumps.
Locomotive and heavy machinery repairs.
Repairs on board ship.

In many cases the flexibility of the Universal Rachet will save the delay and expense of disconnecting and dismounting heavy machinery and repay its cost many times over.

Each Ratchet is boxed separately.

No.	Lgth.	Drill Socket Taper	Length Head	Feed	Approx. Weight Each Pounds	Extra Spindles Each	Price Complete Each	No.
64-M	14	No. 1 Square	4 3/8	1 1/2	5	$3.60	$18.00	**64-M**
64-K	14	" 2 Morse	5 7/8	1 1/2	5	3.60	18.00	**64-K**
65-J	16	" 1 Square	5 1/2	1 7/8	8	4.50	22.50	**65-J**
65-L	16	" 2 "	5 1/2	1 7/8	8	4.50	22.50	**65-L**
65-O	16	" 3 Morse	7	1 7/8	8	4.50	22.50	**65-O**
66-F	18	" 2 Square	5 7/8	2 1/4	12	5.40	27.00	**66-F**
66-N	18	" 3 Morse	7 3/8	2 1/4	12	5.40	27.00	**66-N**
66-S	18	" 4 "	7 5/8	2 1/4	12	5.40	27.00	**66-S**

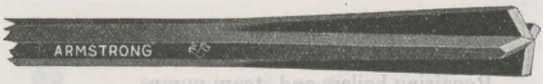
M and K Spindles are interchangeable in No. 64 Ratchet, J, L and O in No. 65 Ratchet and F, N and S in No. 66 Ratchet.

NOTE—By means of Sleeves and Sockets, Spindles can be made to take smaller sizes of Morse Taper Shank Drills, Drills with Square Taper Shanks and Blacksmiths' Drills.

ARMSTRONG STAR DRILLS

Drop Forged, Four Point

These Star Drills are designed for hand drilling in concrete, stone, brick, plaster, tile and asphalt. The four point cutting edge is correctly shaped to drill clean holes with a minimum of effort.



Armstrong Star Drills are drop forged of special steel. They are heat treated and tempered to give long satisfying service.

In reasonable quantities, extra long Star Drills can be furnished; prices on specification.

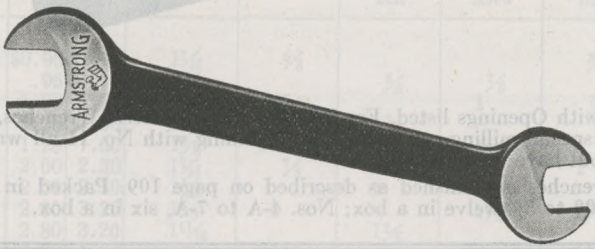
Diameter of Drill in Inches	Length, 8 in.		Length, 12 in.		Length, 18 in.		Length, 24 in.	
	Price per Doz.	Weight Doz. Lbs.	Price per Doz.	Weight Doz. Lbs.	Price per Doz.	Weight Doz. Lbs.	Price per Doz.	Weight Doz. Lbs.
1/4	$ 8.25	3/4	$ 8.50	1 1/4	$11.00	1 3/4	$13.50	2 1/2
5/16	8.25	1 1/2	8.50	2 1/4	11.00	3 1/4	13.50	4 1/4
3/8	8.25	2 1/4	8.50	3 1/4	11.00	5	13.50	6 3/4
7/16	8.70	2 1/4	9.00	3 1/4	11.50	5	14.00	6 3/4
1/2	9.65	3 1/4	10.00	4 3/4	12.50	7 1/4	15.00	9 3/4
9/16	11.65	3 1/4	12.00	4 3/4	15.00	7 1/4	17.50	9 3/4
5/8	11.65	4 1/4	12.00	6 1/2	15.00	9 3/4	17.50	13
11/16	13.70	7	14.00	10 3/4	17.50	16	20.00	21 1/2
3/4	13.70	7	14.00	10 3/4	17.50	16	20.00	21 1/2
7/8	15.30	7	16.00	10 3/4	20.00	16	22.50	21 1/2
1	17.00	8 3/4	18.00	13 1/4	22.50	19 3/4	25.00	26 1/2
1 1/8	.....	.....	24.00	21	28.00	30	32.00	42
1 1/4	.....	.....	30.00	22	35.00	33	40.00	44
1 3/8	.....	.....	40.00	26	45.00	39	50.00	52
1 1/2	.....	.....	50.00	26	56.00	39	62.00	52

ARMSTRONG DROP FORGED WRENCHES

(Carbon Steel)*

Our wrenches are forged from steel which careful tests and analysis have shown to possess the requisite qualities to give both stiffness and tensile strength.

The designs and proportions are based upon practical knowledge of wrench requirements, while modern equipment and manufacturing methods insure accuracy and uniformity in both machining and finish.



FINISHED wrenches are milled, smoothly burnished, hardened and finished in black baked enamel. The wrench heads are ground bright and plainly stamped with catalog number and nominal size of opening.

UNFINISHED wrenches are milled, hardened and sand-blasted. Catalog number is stamped on each wrench.

All openings are milled slightly larger than nominal listed sizes to allow for proper clearance.

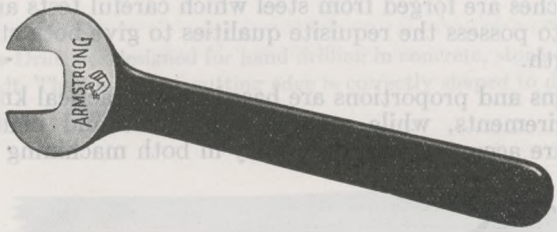
SPECIAL WRENCHES—In lots of 100 or more of any size for which we have the necessary tools, wrenches with special openings will be furnished at no extra charge. In addition to the standard patterns listed, we are also prepared to furnish practically any special wrench in reasonable quantities. Send your specifications for quotation.

When ordering be careful to specify catalog numbers.

*For description of Armstrong Vanadium Super Quality Wrenches, see page 145.

ENGINEERS' WRENCHES

15° Angle, Single Head



In stock with Openings listed. For Whitworth and Metric Wrenches, see pages 142-143. For special milling, see page 109. Beginning with No. 11 all wrenches are of this style but have tapered handles.

These Wrenches are finished as described on page 109. Packed in cardboard boxes—Nos. 00 to 3, twelve in a box; Nos. 4-A to 7-A, six in a box.

New No.	Old No.	PRICE EACH		Nominal Opening	For U. S. Std. Nut Size Bolt	For Amer. Std. Nut (Reg.) and Finished Bolt	For Hex. Head Cap Screw; Diameter Screw	For S.A.E.Std. Nut and Cap Screw; Size Bolt	Extreme Length, Approx.	Approx. Weight Each, Pounds
		Unfinished	Finished							
00	00	$0.22	$0.28	5/16	1/8		1/8		3 1/2	1/16
700	0-A	.24	.30	3/8			3/16		3 1/2	1/12
0	0	.24	.30	13/32	3/16				3 1/2	1/12
701	1-A	.29	.36	7/16		1/4	1/4	1/4	4 1/2	1/8
1	1	.29	.36	1/2	1/4		5/16	5/16	4 1/2	1/8
702	2-A	.35	.44	9/16		5/16	3/8	3/8	5 1/2	1/4
2	2	.35	.44	19/32	5/16				5 1/2	1/4
703	3-A	.42	.52	5/8		3/8	7/16	7/16	6 1/2	1/3
3	3	.42	.52	11/16	3/8				6 1/2	1/3
704	4-A	.52	.64	3/4		7/16	1/2	1/2	7 1/8	1/2
4	4	.52	.64	25/32	7/16				7 1/8	1/2
705	5-A	.62	.76	13/16		1/2	9/16		8 1/4	2/3
5	5	.62	.76	7/8	1/2	9/16	5/8	9/16	8 1/4	2/3
6-A	6-B	.76	.92	15/16				5/8	9	1
6	6	.76	.92	31/32	9/16				9	1
706	6-A	.76	.92	1		5/8	3/4	11/16	9	1

Continued on page 111.

ENGINEERS' WRENCHES

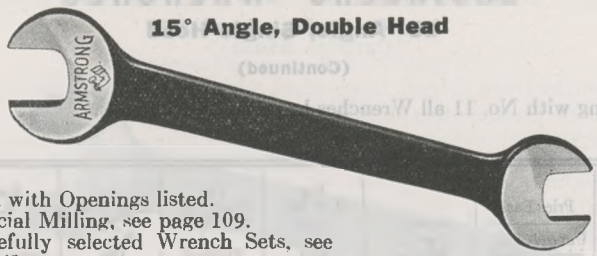
15° Angle, Single Head

(Continued)

Beginning with No. 11 all Wrenches have tapered handles.

New No.	Old No.	Price Each		Nominal Opening Milled	For U. S. Std. Nut; Size Bolt	For Amer. Std. Nut (Reg.) and Finished Bolt	For Hex. Head Cap Screw; Dia. Screw	For S. A. E. Std. Nut and Cap Screw; Size Bolt	Extreme Lgth., App.	App. Wgt. Each, Lbs.
		Unfinished	Finished							
7	7	$0.96	$1.14	1 1/16	5/8			3/4	10 1/2	1 1/4
707	7-A	.96	1.14	1 1/8		3/4	7/8		10 1/2	1 1/4
8	8	1.28	1.50	1 1/4	3/4		1	7/8	11 3/4	1 3/4
8-A	8-A	1.28	1.50	1 5/16		7/8			11 3/4	1 3/4
708-A	8-B	1.28	1.50	1 3/8			1 1/8		11 3/4	1 3/4
9	9	2.00	2.30	1 7/16	7/8			1	13 1/4	2
709	9-A	2.00	2.30	1 1/2		1	1 1/4		13 1/4	2
10	10	2.80	3.20	1 5/8	1		1 3/8	1 1/8	15	4
10-A	10-A	2.80	3.20	1 11/16		1 1/8			15	4
11	11	3.80	4.20	1 13/16	1 1/8			1 1/4	17	5
11-A	11-A	3.80	4.20	1 7/8		1 1/4			17	5
12	12	5.20	5.70	2	1 1/4			1 3/8	19	7
12-A	12-A	5.20	5.70	2 1/16		1 3/8			19	7
13	13	6.70	7.30	2 3/16	1 3/8			1 1/2	21	9
13-A	13-A	6.70	7.30	2 1/4		1 1/2			21	9
14	14	8.25	9.20	2 3/8	1 1/2				23	11
14-A	14-A	8.25	9.20	2 7/16		1 5/8			23	11
15	15	10.00	11.20	2 9/16	1 5/8				25	12 1/2
15-A	15-A	10.00	11.20	2 5/8		1 3/4			25	12 1/2
16	16	11.90	13.40	2 3/4	1 3/4				27	17
16-A	16-A	11.90	13.40	2 15/16	1 7/8				27	17
17-A	17-A	18.70	20.50	3		2			30	20
17	17	18.70	20.50	3 1/8	2				30	20
18-A	18-A	27.50	29.50	3 3/8		2 1/4			33	30
18	18	27.50	29.50	3 1/2	2 1/4				33	30
19-B	19-B	39.75	42.00	3 3/4		2 1/2			37	38
19	19	39.75	42.00	3 7/8	2 1/2				37	38
19-C	19-C	39.75	42.00	4 1/8		2 3/4			37	38
19-A	19-A	39.75	42.00	4 1/4	2 3/4				37	38
20-B	20-B	58.50	62.00	4 1/2		3			42	54
20	20	58.50	62.00	4 5/8	3				42	54
20-A	20-A	58.50	62.00	5	3 1/4				42	54

ENGINEERS' WRENCHES



15° Angle, Double Head

In stock with Openings listed.
For Special Milling, see page 109.
For carefully selected Wrench Sets, see pages 138-141.
For Whitworth and Metric Wrenches, see pages 142-143.
These Wrenches are finished as described on page 109.
Packed in cardboard boxes; Nos. 721 to 27, twelve in a box; Nos. 728 to 35-A, six in a box.

New No	Old No	Price Each		Nominal Openings Milled	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts (Reg.) and Finished Bolts	For Hex. Head Cap Screws; Dia. Screws	For S. A. E. Std. Nuts and Cap Screws; Size Bolt	Extreme Lgth., App.	App. Wgt. Each, Lbs.
		Unfinished	Finished							
721	21-A	$0.28	$0.34	5/16 & 3/8	1/8		1/8 & 3/16		4 1/8	1/16
21	21	.28	.34	5/16 & 13/32	1/8 & 3/16		1/8		4 1/8	1/16
722	22-A	.34	.42	5/16 & 7/16	1/8	1/4	1/8 & 1/4	1/4	4 1/2	1/8
22	22	.34	.42	5/16 & 1/2	1/8 & 1/4		1/8 & 5/16	5/16	4 1/2	1/8
723	23-A	.34	.42	3/8 & 7/16		1/4	3/16 & 1/4	1/4	4 1/2	1/8
723-A	23-B	.34	.42	3/8 & 1/2	1/4		3/16 & 5/16	5/16	4 3/4	3/16
23	23	.34	.42	13/32 & 1/2	3/16 & 1/4		5/16	5/16	4 3/4	3/16
724	24-A	.40	.50	3/8 & 9/16		5/16	3/16 & 3/8	3/8	5	1/4
24	24	.40	.50	13/32 & 19/32	3/16 & 5/16				5	1/4
725	25-A	.40	.50	7/16 & 1/2	1/4	1/4	1/4 & 5/16	1/4 & 5/16	5	1/4
725-A	25-B	.40	.50	7/16 & 9/16		1/4 & 5/16	1/4 & 3/8	1/4 & 3/8	5	1/4
725-B	25-C	.40	.50	1/2 & 9/16	1/4	5/16	5/16 & 3/8	5/16 & 3/8	5 1/2	5/16
25-A	25-D	.40	.50	7/16 & 5/8		1/4 & 3/8	1/4 & 7/16	1/4 & 7/16	5 1/2	5/16
25	25	.40	.50	1/2 & 19/32	1/4 & 5/16		5/16	5/16	5 1/2	5/16
726	26-A	.50	.62	1/2 & 5/8	1/4	3/8	5/16 & 7/16	5/16 & 7/16	6	3/8
26	26	.50	.62	1/2 & 11/16	1/4 & 3/8		5/16	5/16	6	3/8
727	27-A	.50	.62	9/16 & 5/8		5/16 & 3/8	3/8 & 7/16	3/8 & 7/16	6	3/8
27-C	27-B	.50	.62	9/16 & 11/16	3/8	5/16	3/8	3/8	6 1/2	7/16
27	27	.50	.62	19/32 & 11/16	5/16 & 3/8				6 1/2	7/16
728	28-A	.60	.74	9/16 & 3/4		5/16 & 7/16	3/8 & 1/2	3/8 & 1/2	7	1/2
28	28	.60	.74	19/32 & 25/32	5/16 & 7/16				7	1/2

Continued on page 113.

ENGINEERS' WRENCHES

15° Angle, Double Head

(Continued)

New No.	Old No.	Price Each		Nominal Openings Milled	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts (Reg.) and Finished Bolts	For Hex. Head Cap Screws; Dia. Screws	For S. A. E. Std. Nuts and Cap Screws; Size Bolt	Extreme Lgth., App.	App. Wgt. Each, Lbs.
		Unfinished	Finished							
729	29-A	$0.60	$0.74	5/8 & 3/4		3/8 & 7/16	7/16 & 1/2	7/16 & 1/2	7	1/2
28-S	28-S	.60	.74	5/8 & 25/32	7/16	3/8	7/16	7/16	7	1/2
29	29	.60	.74	11/16 & 25/32	3/8 & 7/16				7 1/2	9/16
730	30-A	.74	.90	5/8 & 13/16		3/8 & 1/2	7/16 & 9/16	7/16	8	5/8
730-A	30-B	.74	.90	5/8 & 7/8	1/2	3/8 & 9/16	7/16 & 5/8	7/16 & 9/16	8	5/8
30	30	.74	.90	11/16 & 7/8	3/8 & 1/2	9/16	5/8	9/16	8	5/8
731	31-A	.74	.90	3/4 & 13/16		7/16 & 1/2	1/2 & 9/16	1/2	9	7/8
731-A	31-B	.74	.90	3/4 & 7/8	1/2	7/16 & 9/16	1/2 & 5/8	1/2 & 9/16	9	7/8
31	31	.74	.90	25/32 & 7/8	7/16 & 1/2	9/16	5/8	9/16	9	7/8
731-B	31-C	.74	.90	13/16 & 7/8	1/2	1/2 & 9/16	9/16 & 5/8	9/16	9	7/8
32	32	.90	1.10	25/32 & 31/32	7/16 & 9/16				10	1 1/16
32-A	32-A	.90	1.10	3/4 & 1		7/16 & 5/8	1/2 & 3/4	1/2 & 11/16	10	1 1/16
732	32-B	.90	1.10	13/16 & 1		1/2 & 5/8	9/16 & 3/4	11/16	10	1 1/16
33-A	33-B	.90	1.10	7/8 & 15/16	1/2	9/16	5/8	9/16 & 5/8	10	1 1/16
33	33	.90	1.10	7/8 & 31/32	1/2 & 9/16	9/16	5/8	9/16	10	1 1/16
733	33-A	.90	1.10	7/8 & 1	1/2	9/16 & 5/8	5/8 & 3/4	9/16 & 11/16	10	1 1/16
33-C	33-C	.90	1.10	15/16 & 1		5/8	3/4	5/8 & 11/16	10	1 1/16
34	34	1.12	1.36	7/8 & 1 1/16	1/2 & 5/8	9/16	5/8	9/16 & 3/4	11	1 1/2
734	34-B	1.12	1.36	7/8 & 1 1/8	1/2	9/16 & 3/4	5/8 & 7/8	9/16	11	1 1/2
34-A	34-A	1.12	1.36	15/16 & 1 1/16	5/8			5/8 & 3/4	11	1 1/2
35	35	1.12	1.36	31/32 & 1 1/16	9/16 & 5/8			3/4	11	1 1/2
735	35-A	1.12	1.36	1 & 1 1/8		5/8 & 3/4	3/4 & 7/8	11/16	11	1 1/2
36	36	1.62	1.92	31/32 & 1 1/4	9/16 & 3/4		1	7/8	12 1/2	2 3/16
736	36-A	1.62	1.92	1 & 1 1/4	3/4	5/8	3/4 & 1	11/16 & 7/8	12 1/2	2 3/16
736-A	36-B	1.62	1.92	1 & 1 5/16		5/8 & 7/8	3/4	11/16	12 1/2	2 3/16
37	37	1.62	1.92	1 1/16 & 1 1/4	5/8 & 3/4		1	3/4 & 7/8	12 1/2	2 3/16
737	37-A	1.62	1.92	1 1/8 & 1 1/4	3/4	3/4	7/8 & 1	7/8	12 1/2	2 3/16
37-A	37-B	1.62	1.92	1 1/8 & 1 5/16		3/4 & 7/8	7/8		12 1/2	2 3/16
738	37-S	2.40	2.80	1 1/8 & 1 3/8		3/4	7/8 & 1 1/8		13 1/2	2 1/2
38	38	2.40	2.80	1 1/16 & 1 7/16	5/8 & 7/8			3/4 & 1	13 1/2	2 1/2
38-A	38-A	2.40	2.80	1 1/8 & 1 1/2		3/4 & 1	7/8 & 1 1/4		13 1/2	2 1/2
739	39-A	2.40	2.80	1 1/4 & 1 3/8	3/4		1 & 1 1/8	7/8	13 1/2	2 1/2
39	39	2.40	2.80	1 1/4 & 1 7/16	3/4 & 7/8		1	7/8 & 1	13 1/2	2 1/2
739-A	39-B	2.40	2.80	1 1/4 & 1 1/2	3/4	1	1 & 1 1/4	7/8	13 1/2	2 1/2
39-A	39-C	2.40	2.80	1 5/16 & 1 1/2		7/8 & 1	1 1/4		13 1/2	2 1/2

Continued on page 114.

ENGINEERS' WRENCHES

15° Angle, Double Head

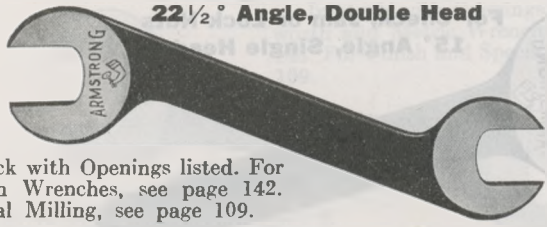
(Continued)

New No.	Old No.	Price Each		Nominal Openings Milled	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts (Reg.) and Finished Bolts	For Hex. Head Cap Screws; Dia. Screws	For S. A. E. Std. Nuts and Cap Screws; Size Bolt	Extreme Lgth., App.	App. Wgt. Each, Lbs.
		Unfinished	Finished							
40	40	$3.30	$3.80	1 1/4 & 1 5/8	3/4 & 1		1 & 1 3/8	7/8 & 1 1/8	15 1/2	4
40-A	40-A	3.30	3.80	1 5/16 & 1 11/16		7/8 & 1 1/8			15 1/2	4
41	41	3.30	3.80	1 7/16 & 1 5/8	7/8 & 1		1 3/8	1 & 1 1/8	15 1/2	4
42	42	4.60	5.30	1 7/16 & 1 13/16	7/8 & 1 1/8			1 & 1 1/4	17	5
42-A	42-A	4.60	5.30	1 1/2 & 1 11/16		1 & 1 1/8	1 1/4		17	5
42-B	42-B	4.60	5.30	1 1/2 & 1 7/8		1 & 1 1/4	1 1/4		17	5
43	43	4.60	5.30	1 5/8 & 1 13/16	1 & 1 1/8		1 3/8	1 1/8 & 1 1/4	17	5
44	44	6.25	7.20	1 5/8 & 2	1 & 1 1/4		1 3/8	1 1/8 & 1 3/8	19	7 1/2
44-A	44-A	6.25	7.20	1 11/16 & 1 7/8		1 1/8 & 1 1/4			19	7 1/2
45	45	6.25	7.20	1 13/16 & 2	1 1/8 & 1 1/4			1 1/4 & 1 3/8	19	7 1/2
46-A	46-A	9.30	10.50	1 11/16 & 2 1/4		1 3/8 & 1 1/2			21	10
46	46	9.30	10.50	1 13/16 & 2 3/16	1 1/8 & 1 3/8			1 1/4 & 1 1/2	21	10
47-A	47-A	9.30	10.50	1 7/8 & 2 1/4		1 1/4 & 1 1/2			21	10
47	47	9.30	10.50	2 & 2 3/16	1 1/4 & 1 3/8			1 3/8 & 1 1/2	21	10
48	48	12.50	14.00	2 & 2 3/8	1 1/4 & 1 1/2			1 3/8	23	13
49	49	12.50	14.00	2 3/16 & 2 3/8	1 3/8 & 1 1/2			1 1/2	23	13
50-A	50-A	16 25	18.00	1 7/8 & 2 5/8		1 1/4 & 1 3/4			25	15 1/2
50	50	16 25	18.00	2 3/16 & 2 9/16	1 3/8 & 1 5/8			1 1/2	25	15 1/2
50-B	50-B	16.25	18.00	2 1/4 & 2 5/8		1 1/2 & 1 3/4			25	15 1/2
51	51	18.00	19.80	2 3/8 & 2 9/16	1 1/2 & 1 5/8				25	15 1/2
52	52	20.00	22.00	2 3/8 & 2 3/4	1 1/2 & 1 3/4				27	17 1/2
53	53	22.00	24.00	2 9/16 & 2 3/4	1 5/8 & 1 3/4				27	17 1/2
54-A	54-A	26.25	28.50	2 1/4 & 3		1 1/2 & 2			31	26
54	54	26.25	28.50	2 9/16 & 3 1/8	1 5/8 & 2				31	26
54-B	54-B	26.25	28.50	2 5/8 & 3		1 3/4 & 2			31	26
55	55	28.75	31.00	2 3/4 & 3 1/8	1 3/4 & 2				31	26
56-A	56-B	37.50	40.00	2 5/8 & 3 3/8		1 3/4 & 2 1/4			34	32
56	56	37.50	40.00	2 3/4 & 3 1/2	1 3/4 & 2 1/4				34	32
57-B	57-B	44.25	47.00	3 & 3 3/8		2 & 2 1/4			37	40
57	57	44.25	47.00	3 1/8 & 3 1/2	2 & 2 1/4				37	40
57-A	57-A	53.00	56.00	3 1/8 & 3 7/8	2 & 2 1/2				37	40

NOTE—Larger sizes double head Engineer's Wrenches can be furnished on specification.

OFF-SET ANGLE WRENCHES

22½° Angle, Double Head



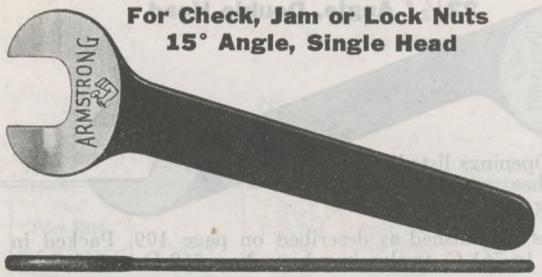
In stock with Openings listed. For Whitworth Wrenches, see page 142. For special Milling, see page 109.

These Wrenches are finished as described on page 109. Packed in cardboard boxes; Nos. 760-A to 761-C, twelve in a box; Nos. 762-D to 765-C, six in a box.

New No.	Old No.	Price Each Finished	Nominal Openings Milled	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts (Reg.) and Finished Bolts	For Hex. Head Cap Screws; Diameter Screws	For S.A.E. Std. Nuts and Cap Screws; Size Bolts	Extreme Lgth., App.	App. Wgt. Each, Lbs.
760-A		$0.50	5/16 & 1/2	1/8 & 1/4		1/8 & 5/16	5/16	4 3/4	1/8
760-B	671-A	.50	13/32 & 1/2	3/16 & 1/4		5/16	5/16	4 3/4	1/8
760-C	671-B	.50	13/32 & 19/32	3/16 & 5/16				4 3/4	1/8
760-Y	671	.50	7/16 & 1/2	1/4	1/4	1/4 & 5/16	1/4 & 5/16	4 3/4	1/8
760-F	671-C	.50	7/16 & 9/16		1/4 & 5/16	1/4 & 3/8	1/4 & 3/8	4 3/4	1/8
760-G	671-D	.50	7/16 & 5/8		1/4 & 3/8	1/4 & 7/16	1/4 & 7/16	4 3/4	1/8
761-X	672-D	.62	1/2 & 9/16	1/4	5/16	5/16 & 3/8	5/16 & 3/8	5 3/4	1/4
761-A	672-A	.62	1/2 & 19/32	1/4 & 5/16		5/16	5/16	5 3/4	1/4
761		.62	1/2 & 5/8	1/4	3/8	5/16 & 7/16	5/16 & 7/16	5 3/4	1/4
761-B		.62	1/2 & 11/16	1/4 & 3/8		5/16	5/16	5 3/4	1/4
761-Z	672	.62	9/16 & 5/8	5/16 & 3/8	3/8 & 7/16	3/8 & 7/16	3/8 & 7/16	5 3/4	1/4
761-C	672-B	.62	19/32 & 11/16	5/16 & 3/8				5 3/4	1/4
762-D	673-F	.80	9/16 & 3/4	5/16 & 7/16	3/8 & 1/2	3/8 & 1/2	7		1/2
762-Y	673-D	.80	5/8 & 3/4	3/8 & 7/16	7/16 & 1/2	7/16 & 1/2	7		1/2
762-E	673-E	.80	5/8 & 13/16	3/8 & 1/2	7/16 & 9/16	7/16	7		1/2
762-B	673-A	.80	11/16 & 25/32	3/8 & 7/16			7		1/2
762-C	673-B	.80	11/16 & 7/8	3/8 & 1/2	9/16	5/8	9/16	7	1/2
763-E	673-C	1.06	3/4 & 13/16	7/16 & 1/2	1/2 & 9/16	1/2 & 5/8	1/2	8 1/4	2/3
763-Y	673	1.06	3/4 & 7/8	7/16 & 9/16	1/2 & 5/8	1/2 & 9/16	8 1/4	2/3
763-A	674-A	1.06	25/32 & 7/8	7/16 & 1/2	9/16	5/8	9/16	8 1/4	2/3
763-F	674-E	1.06	13/16 & 7/8	1/2	1/2 & 9/16	9/16 & 5/8	9/16	8 1/4	2/3
763-D	674	1.06	7/8 & 15/16	1/2	9/16	5/8	9/16 & 5/8	8 1/4	2/3
763-C	674-B	1.06	7/8 & 31/32	1/2 & 9/16	9/16	5/8	9/16	8 1/4	2/3
764-H	675-C	1.44	13/16 & 1		1/2 & 5/8	9/16 & 3/4	11/16	9 1/2	1
764	675-D	1.44	7/8 & 1	1/2	9/16 & 5/8	5/8 & 3/4	9/16 & 11/16	9 1/2	1
764-A	675-A	1.44	7/8 & 1 1/16	1/2 & 5/8	9/16	5/8	9/16 & 3/4	9 1/2	1
764-E	675-F	1.44	7/8 & 1 1/8		9/16 & 3/4	5/8 & 7/8	9/16	9 1/2	1
764-B	675-B	1.44	31/32 & 1 1/16	9/16 & 5/8			3/4	9 1/2	1
765-A	676-A	1.92	1 1/16 & 1 1/4	5/8 & 3/4		1	3/4 & 7/8	11	1 3/4
765-C	676	1.92	1 1/4 & 1 7/16	3/4 & 7/8		1	7/8 & 1	11	1 3/4

THIN WRENCHES

For Check, Jam or Lock Nuts
15° Angle, Single Head



In stock with Openings Listed. For Whitworth and Metric Wrenches, see pages 142-143. For special milling, see page 109.

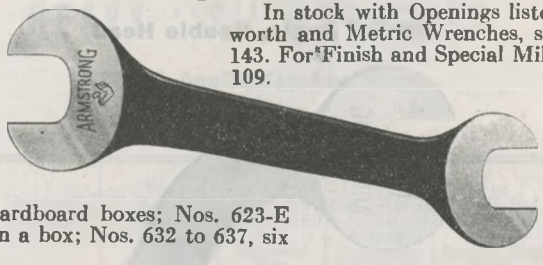
These Wrenches are finished as described on page 109.

Packed in carboard boxes; Nos. 600 to 604, twelve in a box; Nos. 605-A to 608-A, six in a box.

No.	Price Each Finished	Nominal Opening Milled	For U. S. Std. Nut; Size Bolt	For Amer. Std. Jam Nut; Size Bolt	For Hex. Head Cap Screw Dia. Screw	For S.A.E. Std. Nut & Cap Screw Size Bolt	Extreme Length Approx.	Approx. Thickness Head	Approx. Weight Each Lbs.
600	$0.30	13/32	3/16				3 3/4	5/32	1/16
601-A	.36	7/16		1/4	1/4	1/4	4	5/32	1/12
601	.36	1/2	1/4		5/16	5/16	4	5/32	1/12
602-A	.44	9/16		5/16	3/8	3/8	4 1/2	11/64	1/8
602	.44	19/32	5/16				4 1/2	11/64	1/8
603-A	.52	5/8		3/8	7/16	7/16	5 1/4	3/16	1/6
603	.52	11/16	3/8				5 1/4	3/16	1/6
604-A	.64	3/4		7/16	1/2	1/2	6	7/32	1/4
604	.64	25/32	7/16				6	7/32	1/4
605-A	.76	13/16		1/2	9/16		6 3/4	1/4	1/3
605	.76	7/8	1/2	9/16	5/8	9/16	6 3/4	1/4	1/3
606	.90	31/32	9/16				7 1/2	9/32	1/2
606-B	.90	1		5/8	3/4	11/16	7 1/2	9/32	1/2
607	1.08	1 1/16	5/8			3/4	8 1/2	5/16	3/5
607-A	1.08	1 1/8		3/4	7/8		8 1/2	5/16	3/5
608	1.36	1 1/4	3/4		1	7/8	10	3/8	1
608-A	1.36	1 5/16		7/8			10	3/8	1
609	1.84	1 7/16	7/8			1	11 1/2	7/16	1 1/2
609-A	1.84	1 1/2		1	1 1/4		11 1/2	7/16	1 1/2
610	2.60	1 5/8	1		1 3/8	1 1/8	13	1/2	2 1/2
610-A	2.60	1 11/16		1 1/8			13	1/2	2 1/2

THIN WRENCHES

15° Angle, Double Head



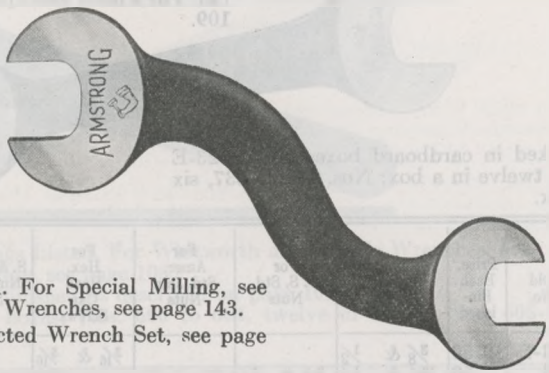
In stock with Openings listed. For Whitworth and Metric Wrenches, see pages 142-143. For Finish and Special Milling, see page 109.

Packed in cardboard boxes; Nos. 623-E to 631, twelve in a box; Nos. 632 to 637, six in a box.

New No.	Old No.	Price, Each Finished	Nominal Openings Milled	For U. S. Std. Nuts	For Amer. Std. Jam Nuts	For Hex. Head Cap Screws	For S. A. E. Std. Nut & Cap Screw	Extreme Lgth., App.	Thickness Head, App.	App. Wgt. Each, Lbs.
623-E	623-E	$0.50	3/8 & 1/2			3/16 & 5/16	5/16	4 3/8	5/32	1/8
623	623	.50	13/32 & 1/2	3/16 & 1/4		5/16	5/16	4 3/8	5/32	1/8
624	623-A	.50	13/32 & 19/32	3/16 & 5/16				4 3/8	5/32	1/8
623-D	623-C	.50	7/16 & 1/2	1/4	1/4	1/4 & 5/16	1/4 & 5/16	4 3/8	5/32	1/8
624-A	623-F	.50	7/16 & 9/16		1/4 & 5/16	1/4 & 3/8	1/4 & 3/8	4 3/8	5/32	1/8
625	623-B	.50	1/2 & 19/32	1/4 & 5/16		5/16	5/16	4 3/8	5/32	1/8
626	626	.64	1/2 & 11/16	1/4 & 3/8		5/16	5/16	5 1/2	3/16	1/5
626-S	626-C	.64	9/16 & 5/8		5/16 & 3/8	3/8 & 7/16	3/8 & 7/16	5 1/2	3/16	1/5
626-X	626-A	.64	9/16 & 11/16	3/8	5/16	3/8	3/8	5 1/2	3/16	1/5
627	626-A	.64	19/32 & 11/16	5/16 & 3/8				5 1/2	3/16	1/5
628	626-B	.64	19/16 & 25/32	5/16 & 7/16				5 1/2	3/16	1/5
629-D	626-F	.64	5/8 & 3/4		3/8 & 7/16	7/16 & 1/2	7/16 & 1/2	5 1/2	3/16	1/5
629	629	.80	11/16 & 25/32	3/8 & 7/16				6 1/2	7/32	1/3
630	629-A	.80	11/16 & 7/8	3/8 & 1/2	9/16	5/8	9/16	6 1/2	7/32	1/3
630-B	629-E	.80	3/4 & 13/16		7/16 & 1/2	1/2 & 9/16	1/2	6 1/2	7/32	1/3
630-E	629-C	.80	3/4 & 7/8	1/2	7/16 & 9/16	1/2 & 5/8	1/2 & 9/16	6 1/2	7/32	1/3
631	629-B	.80	25/32 & 7/8	7/16 & 1/2		5/8	9/16	6 1/2	7/32	1/3
632	632	1.12	25/32 & 31/32	7/16 & 9/16				8	9/32	5/8
633-A	632-D	1.12	13/16 & 1		1/2 & 5/8	9/16 & 3/4	11/16	8	9/32	5/8
633	632-A	1.12	7/8 & 31/32	1/2 & 9/16	9/16	5/8	9/16	8	9/32	5/8
634	632-B	1.12	7/8 & 1 1/16	1/2 & 5/8	9/16	5/8	9/16 & 3/4	8	9/32	5/8
632-X	632-C	1.12	15/16 & 1		5/8	3/4	5/8 & 11/16	8	9/32	5/8
635	635	1.68	31/32 & 1 1/16	9/16 & 5/8			3/4	10	11/32	1
636	635-A	1.68	31/32 & 1 1/4	9/16 & 3/4		1	7/8	10	11/32	1
635-D	635-C	1.68	1 & 1 1/8		5/8 & 3/4	3/4 & 7/8	11/16	10	11/32	1
637	635-B	1.68	1 1/16 & 1 1/4	5/8 & 3/4		1	3/4 & 7/8	10	11/32	1
638	638	2.60	1 1/16 & 1 7/16	5/8 & 7/8			3/4 & 1	12	13/32	2
639	638-A	2.60	1 1/4 & 1 7/16	3/4 & 7/8		1	7/8 & 1	12	13/32	2
640	638-B	2.60	1 1/4 & 1 5/8	3/4 & 1		1 & 1 3/8	7/8 & 1 1/8	12	13/32	2
640-A	638-D	2.60	1 5/16 & 1 1/2		7/8 & 1	1 1/4		12	13/32	2

HEAVY "S" WRENCHES

22½° Angle, Double Head



In stock as listed. For Special Milling, see page 109. For Metric Wrenches, see page 143.

For carefully selected Wrench Set, see page 141.

These Wrenches are finished as described on page 109. Packed in cardboard boxes; Nos. 661-D to 663-C, twelve in a box; Nos. 664-A to 666-F, six in a box.

No	Price Each Finished	Nominal Openings Milled,	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts (Reg.) and Finished Bolts	For Hex. Head Cap Screws; Diameter Screws	For S. A. E. Std. Nuts and Cap Screws; Size Bolts	Extreme Lgth., App.	App. Wgt. Each, Lbs.
661-D	$0.44	5/16 & 3/8	1/8		1/8 & 3/16		4	1/6
661-A	.44	5/16 & 13/32	1/8 & 3/16		1/8		4	1/6
661-E	.44	5/16 & 7/16	1/8	1/4	1/8 & 1/4	1/4	4	1/6
661-B	.44	5/16 & 1/2	1/8 & 1/4		1/8 & 5/16	5/16	4	1/6
661-F	.44	3/8 & 7/16		1/4	3/16 & 1/4	1/4	4	1/6
661-G	.44	3/8 & 1/2			3/16 & 5/16	5/16	4	1/6
661-C	.44	13/32 & 1/2	3/16 & 1/4		5/16	5/16	4	1/6
662-A	.58	13/32 & 19/32	3/16 & 5/16				5	1/4
662-D	.58	7/16 & 1/2	1/4	1/4	1/4 & 5/16	1/4 & 5/16	5	1/4
662-E	.58	7/16 & 9/16		1/4 & 5/16	1/4 & 3/8	1/4 & 3/8	5	1/4
662-P	.58	7/16 & 5/8		1/4 & 3/8	1/4 & 7/16	1/4 & 7/16	5	1/4
662-F	.58	1/2 & 9/16	1/4	5/16	5/16 & 3/8	5/16 & 3/8	5	1/4
662-B	.58	1/2 & 19/32	1/4 & 5/16		5/16	5/16	5	1/4
662-G	.58	1/2 & 5/8	1/4	3/8	5/16 & 7/16	5/16 & 7/16	5	1/4
662-C	.58	1/2 & 11/16	1/4 & 3/8		5/16	5/16	5	1/4

Continued on page 119.

HEAVY "S" WRENCHES

22½° Angle, Double Head

(Continued)

No.	Price Each Finished	Nominal Openings Milled,	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts (Reg.) and Finished Bolts	For Hex. Head Cap Screws; Diameter Screws	For S. A. E. Std. Nuts and Cap Screws; Size Bolts	Extreme Lgth., App.	App. Wgt. Each, Lbs.
663-D	$0.78	9/16 & 5/8		5/16 & 3/8	3/8 & 7/16	3/8 & 7/16	6¼	½
663-E	.78	9/16 & 3/4		5/16 & 7/16	3/8 & ½	3/8 & ½	6¼	½
663-A	.78	19/32 & 11/16	5/16 & 3/8				6¼	½
663-B	.78	19/32 & 25/32	5/16 & 7/16				6¼	½
663-F	.78	5/8 & 3/4		3/8 & 7/16	7/16 & ½	7/16 & ½	6¼	½
663-G	.78	5/8 & 13/16		3/8 & ½	7/16 & 9/16	7/16	6¼	½
663-C	.78	11/16 & 25/32	3/8 & 7/16				6¼	½
664-A	1.06	11/16 & 7/8	3/8 & ½	9/16	5/8	9/16	7½	⅞
664-D	1.06	3/4 & 13/16		7/16 & ½	½ & 9/16	½	7½	⅞
664-E	1.06	3/4 & 7/8	½	7/16 & 9/16	½ & 5/8	½ & 9/16	7½	⅞
664-B	1.06	25/32 & 7/8	7/16 & ½	9/16	5/8	9/16	7½	⅞
664-C	1.06	25/32 & 31/32	7/16 & 9/16				7½	⅞
664-F	1.06	13/16 & 7/8	½	½ & 9/16	9/16 & 5/8	9/16	7½	⅞
665-D	1.44	13/16 & 1		½ & 5/8	9/16 & 3/4	11/16	9	1⅜
665-A	1.44	7/8 & 31/32	½ & 9/16	9/16	5/8	9/16	9	1⅜
665-E	1.44	7/8 & 1	½	9/16 & 5/8	5/8 & 3/4	9/16 & 11/16	9	1⅛
665-B	1.44	7/8 & 1 1/16	½ & 5/8	9/16	5/8	9/16 & 3/4	9	1⅜
665-F	1.44	7/8 & 1 1/8	½	9/16 & 3/4	5/8 & 7/8	9/16	9	1⅜
665-C	1.44	31/32 & 1 1/16	9/16 & 5/8			3/4	9	1⅜
665-G	1.44	1 & 1 1/8		5/8 & 3/4	3/4 & 7/8	11/16	9	1⅜
666-A	2.00	31/32 & 1 1/4	9/16 & 3/4		1	7/8	10½	2
666-N	2.00	1 & 15/16		5/8 & 7/8	3/4	11/16	10½	2
666-B	2.00	1 1/16 & 1 1/4	5/8 & 3/4		1	3/4 & 7/8	10½	2
666-E	2.00	1 1/8 & 1 1/4	3/4	3/4	7/8 & 1	7/8	10½	2
666-S	2.00	1 1/8 & 15/16		3/4 & 7/8	7/8		10½	2
666-F	2.00	1 1/8 & 1 3/8		3/4	7/8 & 1 1/8		10½	2
667-L	2.90	1 1/8 & 1 1/2		3/4 & 1	7/8 & 1 1/4		12	3½
667-D	2.90	1 1/4 & 1 3/8	3/4		1 & 1 1/8	7/8	12	3½
667-A	2.90	1 1/4 & 1 7/16	3/4 & 7/8		1	7/8 & 1	12	3½
667-B	2.90	1 1/4 & 1 5/8	3/4 & 1		1 & 1 3/8	7/8 & 1 1/8	12	3½
667-N	2.90	1 5/16 & 1 1/2		7/8 & 1	1 1/4		12	3½
667-F	2.90	1 3/8 & 1 1/2		1	1 1/8 & 1 1/4		12	3½
667-C	2.90	1 7/16 & 1 5/8	7/8 & 1		1 3/8	1 & 1 1/8	12	3½
668-C	5.00	1 5/8 & 2	1 & 1 1/4		1 3/8	1 1/8 & 1 3/8	14	5½

LIGHT "S" WRENCHES

Extra Long—For General Use
22½° Angle, Double Head

In stock as listed. For Finish and Special Milling, see page 109. For Whitworth and Metric Wrenches, see pages 142-143.

For carefully selected Wrench Sets, see pages 140-141.

Packed in cardboard boxes; Nos. 75-C to 75, twelve in a box; Nos. 77-S to 83-A, six in a box.

New No.	Old No.	Price Each Unfinished	Price Each Finished	Nominal Openings Milled	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts (Reg.) and Finished Bolts	For Hex. Head Cap Screws; Dia. Screws	For S. A. E. Std. Nuts and Cap Screws; Size Bolts	Extreme Lgth., App.	App. Wgt. Each, Lbs.
75-C	475-C	$0.45	$0.54	1/4 & 5/16	1/8		1/8		6 1/4	1/6
75-B	475-B	.45	.54	3/8 & 7/16		1/4	3/16 & 1/4	1/4	6 1/4	1/6
75-A	475-A	.45	.54	3/8 & 1/2	1/4		3/16 & 5/16	5/16	6 1/4	1/6
75	475	.45	.54	13/32 & 1/2	3/16 & 1/4		5/16	5/16	6 1/4	1/6
77-S	477-A	.58	.68	7/16 & 1/2	1/4	1/4	1/4 & 5/16	1/4 & 5/16	7 1/8	1/4
77-C	477-D	.58	.68	7/16 & 9/16		1/4 & 5/16	1/4 & 3/8	1/4 & 3/8	7 1/8	1/4
77-E	477-E	.58	.68	7/16 & 5/8		1/4 & 3/8	1/4 & 7/16	1/4 & 7/16	7 1/8	1/4
77-B	477-B	.58	.68	1/2 & 9/16	1/4	5/16	5/16 & 3/8	5/16 & 3/8	7 1/8	1/4
77	477	.58	.68	1/2 & 5/8	1/4	3/8	5/16 & 7/16	5/16 & 7/16	7 1/8	1/4
79-S	479-B	.73	.86	9/16 & 5/8		5/16 & 3/8	3/8 & 7/16	3/8 & 7/16	8 1/4	1/2
79-A	479-A	.73	.86	9/16 & 11/16	3/8	5/16	3/8	3/8	8 1/4	1/2
79-E	479-D	.73	.86	9/16 & 3/4		5/16 & 7/16	3/8 & 1/2	3/8 & 1/2	8 1/4	1/2
79-D	479-C	.73	.86	19/32 & 11/16	5/16 & 3/8				8 1/4	1/2
79	479	.73	.86	5/8 & 11/16	3/8	3/8	7/16	7/16	8 1/4	1/2
79-C	479-E	.73	.86	5/8 & 3/4		3/8 & 7/16	7/16 & 1/2	7/16 & 1/2	8 1/4	1/2
81-H	481-D	.93	1.10	5/8 & 13/16		3/8 & 1/2	7/16 & 9/16	7/16	9 1/4	3/4
81	481	.93	1.10	11/16 & 27/32	3/8				9 1/4	3/4
81-B	481-B	.93	1.10	3/4 & 13/16		7/16 & 1/2	1/2 & 9/16	1/2	9 1/4	3/4
81-A	481-A	.93	1.10	3/4 & 7/8	1/2	7/16 & 9/16	1/2 & 5/8	1/2 & 9/16	9 1/4	3/4
83-J	483-E	1.16	1.40	13/16 & 1		1/2 & 5/8	9/16 & 3/4	11/16	10 3/8	1
83	483	1.16	1.40	27/32 & 15/16				5/8	10 3/8	1
83-B	483-B	1.16	1.40	7/8 & 1	1/2	9/16 & 5/8	5/8 & 3/4	9/16 & 11/16	10 3/8	1
83-A	483-A	1.16	1.40	15/16 & 1		5/8	3/4	5/8 & 11/16	10 3/8	1
83-C	485-D	1.16	1.40	1/8 & 1 1/16	1/2 & 5/8	9/16	5/8	9/16 & 3/4	10 3/8	1
85	485	1.65	2.00	1 & 1 1/8		5/8 & 3/4	3/4 & 7/8	11/16	12	2
85-J	485-E	1.65	2.00	1 & 1 5/16		5/8 & 7/8	3/4		12	2
85-C	485-C	1.65	2.00	1 1/16 & 1 1/4	5/8 & 3/4		1	3/4 & 7/8	12	2
85-B	485-B	1.65	2.00	1 1/8 & 1 1/4	3/4	3/4	7/8 & 1	7/8	12	2
85-K	485-F	1.65	2.00	1 1/8 & 1 5/16		3/4 & 7/8	7/8		12	2

CAR WRENCHES

22½° Angle, Double Head Long Leverage

Hardened Car Wrenches are milled, hardened throughout and sand-blasted; heads are not ground bright. Unhardened wrenches are milled only.

No.	Price Each		Nominal Openings Milled	For U. S. Std. Nuts; Bolt Size	For Amer. Std. Nuts (Reg.); Bolt Size	Extreme Length Approx.	Approx. Weight Each, Pounds
	Unhardened	Hardened					
367-A	$1.10	$1.50	5/8 & 13/16		3/8 & 1/2	12	1½
367	1.10	1.50	1 1/16 & 7/8	3/8 & 1/2	9/16	12	1½
370-A	1.90	2.50	13/16 & 1		1/2 & 5/8	19	3
370	1.90	2.50	7/8 & 1 1/16	1/2 & 5/8	9/16	19	3
370-B	1.90	2.50	1 & 1 1/8		5/8 & 3/4	19	3
371	2.30	3.10	7/8 & 1 1/4	1/2 & 3/4		20	3½
373	2.30	3.10	1 1/16 & 1 1/4	5/8 & 3/4		20	3½
373-A	2.30	3.10	1 1/8 & 1 5/16		3/4 & 7/8	20	3½
374	2.70	3.70	1 1/16 & 1 7/16	5/8 & 7/8		21	4
374-A	2.70	3.70	1 1/8 & 1 1/2		3/4 & 1	21	4
376	2.70	3.70	1 1/4 & 1 7/16	3/4 & 7/8		21	4
376-A	2.70	3.70	1 5/16 & 1 1/2		7/8 & 1	21	4
377	3.30	4.50	1 1/4 & 1 5/8	3/4 & 1		22	5
377-A	3.30	4.50	1 5/16 & 1 11/16		7/8 & 1 1/8	22	5
379	3.30	4.50	1 7/16 & 1 5/8	7/8 & 1		22	5
379-A	3.30	4.50	1 1/2 & 1 11/16		1 & 1 1/8	22	5
380	3.90	5.30	1 7/16 & 1 13/16	7/8 & 1 1/8		23	5¾
380-A	3.90	5.30	1 1/2 & 1 7/8		1 & 1 1/4	23	5¾
382	3.90	5.30	1 5/8 & 1 13/16	1 & 1 1/8		23	5¾
382-A	3.90	5.30	1 11/16 & 1 7/8		1 1/8 & 1 1/4	23	5¾
383	4.50	6.30	1 5/8 & 2	1 & 1 1/4		24	6¾
385	4.50	6.30	1 13/16 & 2	1 1/8 & 1 1/4		24	6¾
*383-B	4.50	6.30	1 7/8 & 2 1/4		1 1/4 & 1 1/2	24	6¾
387	6.80	9.00	1 13/16 & 2 3/8	1 1/8 & 1 1/2		25	9
389	6.80	9.00	2 & 2 3/8	1 1/4 & 1 1/2		25	9

*Old No. 385-A.

SET SCREW WRENCHES

22½° Angle, Single Head

In stock as listed, with Openings for Standard Set Screws. For special Milling, see page 109.

These Wrenches are finished as described on page 109.

Packed in cardboard boxes; Nos. 500 to 504, twelve in a box; Nos. 505 to 509, six in a box.

New No.	Old No.	Price Each, Finished	For Set Screw; Size	Extreme Length, Approx.	Approx. Weight Each, Pounds
500	92	$0.28	3/16	3	1/25
501	93	.34	1/4	3 5/8	1/16
502	94	.42	5/16	4 1/2	1/10
503	95	.50	3/8	5 3/8	1/6
504	96	.62	7/16	6 1/4	1/3
505	97	.76	1/2	7	3/8
506	98	.92	9/16	7 1/2	1/2
507	99	1.10	5/8	8	3/4
508	100	1.36	3/4	9 1/4	1
509	101	1.68	7/8	10 1/2	1 1/2
510	102	2.20	1	11 1/2	2
511	103	2.80	1 1/8	12	2 1/2

SET SCREW WRENCHES

22½° Angle, Double Head

In stock as listed, with Openings for Standard Set Screws.

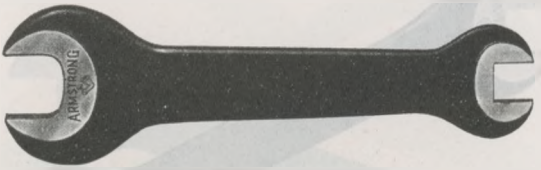
For Special Milling, see page 109.

These Wrenches are finished as described on page 109. Packed in a cardboard boxes; Nos. 523 to 526, twelve in a box; Nos. 527 to 531, six in a box.

New No.	Old No.	Price Each Finished	For Set Screws; Size,	Approx. Extreme Length,	Approx. Weight Each, Pounds
523	65	$0.40	3/16 & 1/4	3 3/8	1/16
524	66	.48	3/16 & 5/16	4	1/8
525	67	.48	1/4 & 5/16	4	1/8
526	68	.58	1/4 & 3/8	5	1/6
527	69	.58	5/16 & 3/8	5	1/6
528	70	.70	5/16 & 7/16	5 7/8	1/3
529	71	.70	3/8 & 7/16	5 7/8	1/3
530	72	.90	3/8 & 1/2	6 5/8	1/2
531	73	.90	7/16 & 1/2	6 5/8	1/2
532	74	1.08	7/16 & 9/16	7 1/2	3/4
533	75	1.08	1/2 & 9/16	7 1/2	3/4
534	76	1.30	1/2 & 5/8	8 3/8	1
535	77	1.30	9/16 & 5/8	8 3/8	1
536	78	1.60	9/16 & 3/4	10	1 1/2
537	79	1.60	5/8 & 3/4	10	1 1/2
538	80	2.00	5/8 & 7/8	11 3/8	2
539	81	2.00	3/4 & 7/8	11 3/8	2
540	82	2.60	3/4 & 1	12 5/8	2 3/4
541	83	2.60	7/8 & 1	12 5/8	2 3/4
542	84	3.50	7/8 & 1 1/8	12 5/8	2 3/4

MACHINE WRENCHES

Extra Heavy for Planers, Milling Machines, Lathes, Drill Presses, Etc.



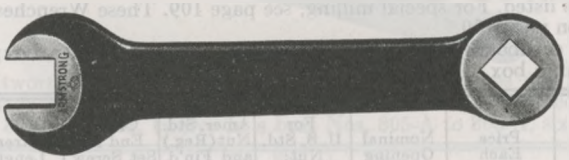
In stock as listed, with Openings for U. S. Standard Finished Nuts and Set Screws. For special Milling, see page 109.

These Wrenches are finished as described on page 109. Packed in cardboard boxes; Nos. 595 to 595-F, twelve in a box; Nos. 596 to 598-F, six in a box.

New No.	Old No.	Price Each Finished	Large Head for U. S. Standard Nut		Small Head for Set Screw Size	Extreme Length Approx.	Approx. Weight Each, Pounds
			Nonimal Opening Milled	Size Bolt			
595	395-A	$1.16	11/16	3/8	3/8	6 1/2	2/3
595-B	395-B	1.16	11/16	3/8	7/16	6 1/2	2/3
595-C	395-C	1.16	11/16	3/8	1/2	6 1/2	2/3
595-D	395-D	1.16	25/32	7/16	3/8	6 1/2	2/3
595-E	395-E	1.16	25/32	7/16	7/16	6 1/2	2/3
595-F	395-F	1.16	25/32	7/16	1/2	6 1/2	2/3
596	396-A	1.44	7/8	1/2	7/16	7 1/2	1
596-B	396-B	1.44	7/8	1/2	1/2	7 1/2	1
596-C	396-C	1.44	7/8	1/2	9/16	7 1/2	1
596-D	396-D	1.44	7/8	1/2	5/8	7 1/2	1
596-E	396-E	1.44	31/32	9/16	7/16	7 1/2	1
596-F	396-F	1.44	31/32	9/16	1/2	7 1/2	1
596-G	396-G	1.44	31/32	9/16	9/16	7 1/2	1
596-H	396-H	1.44	31/32	9/16	5/8	7 1/2	1
597	397-A	1.92	1 1/16	5/8	9/16	8 1/2	1 1/3
597-B	397-B	1.92	1 1/16	5/8	5/8	8 1/2	1 1/3
597-C	397-C	1.92	1 1/16	5/8	3/4	8 1/2	1 1/3
598	398-A	2.70	1 1/4	3/4	3/4	10	1 3/4
598-B	398-B	2.70	1 1/4	3/4	7/8	10	1 3/4
598-C	398-C	2.70	1 1/4	3/4	1	10	1 3/4
598-D	398-D	2.70	1 7/16	7/8	3/4	10	1 3/4
598-E	398-E	2.70	1 7/16	7/8	7/8	10	1 3/4
598-F	398-F	2.70	1 7/16	7/8	1	10	1 3/4

DOUBLE HEAD TOOL POST WRENCHES

For Set Screws



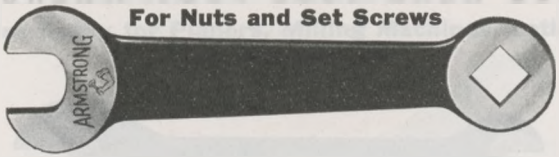
In stock as listed, with Openings for Standard Set Screws. For Special Milling, see page 109.

These Wrenches are finished as described on page 109.

Packed in cardboard boxes; Nos. 553 to 555-C, twelve in a box; Nos. 556 to 557, six in a box.

New No.	Old No.	Price Each Finished	Open End for Set Screws Size	Closed End for Set Screws Size	Extreme Length, Approx.	Approx. Weight Each, Pounds
553	640	$0.90	7/16	7/16	4	1/4
554	641	1.12	7/16	7/16	5 1/2	3/8
554-A	641-A	1.12	1/2	7/16	5 1/2	3/8
555	642	1.24	1/2	1/2	6	1/2
555-B	642-A	1.24	9/16	1/2	6	1/2
555-C	642-B	1.24	9/16	9/16	6	1/2
556	643	1.44	5/8	5/8	6 3/4	3/4
556-B	643-A	1.44	11/16	5/8	6 3/4	3/4
556-C	643-B	1.44	11/16	11/16	6 3/4	3/4
557	644	1.64	3/4	3/4	7 1/2	1

DOUBLE HEAD TOOL POST WRENCHES



In stock as listed. For special milling, see page 109. These Wrenches are fi ished as described on page 109.

Packed in cardboard boxes; Nos. 562-B and 562, twelve in a box; Nos. 563-F to 568-D, six in a box.

New No.	Old No.	Price Each Finished	Nominal Opening Milled	For U. S. Std. Nut; Size Bolt	For Amer. Std. Nut (Reg.) and Fin'd. Bolt	Closed End for Set Screw, Size	Extreme Length Approx.	Approx. Weight Each, Pounds
562-B	651-D	$1.32	5/8		3/8	9/16	6 1/2	1/2
562	651-B	1.32	11/16	3/8		9/16	6 1/2	1/2
563-E	652-E	1.44	13/16		1/2	7/16	7	3/4
563-F	652-F	1.44	13/16		1/2	1/2	7	3/4
563-G	652-G	1.44	13/16		1/2	9/16	7	3/4
563-H	652-H	1.44	13/16		1/2	5/8	7	3/4
563	652-C	1.44	7/8	1/2	9/16	7/16	7	3/4
563-B	652	1.44	7/8	1/2	9/16	1/2	7	3/4
563-C	652-A	1.44	7/8	1/2	9/16	9/16	7	3/4
563-D	652-B	1.44	7/8	1/2	9/16	5/8	7	3/4
564-C	652-J	1.44	1		5/8	5/8	7	3/4
565-C	653-B	1.94	1		5/8	3/4	8	1
564	653	1.94	1 1/16	5/8		5/8	8	1
565	653-A	1.94	1 1/16	5/8		3/4	8	1
566-C	654-A	2.40	1 1/8		3/4	3/4	9	1 1/2
566-D	654-B	2.40	1 1/8		3/4	7/8	9	1 1/2
566	654	2.40	1 1/4	3/4		3/4	9	1 1/2
566-B	654-C	2.40	1 1/4	3/4		7/8	9	1 1/2
567-D	655-A	3.20	1 1/8		3/4	1	10	2 1/4
567	655-B	3.20	1 1/4	3/4		1	10	2 1/4
567-E	655-C	3.20	1 5/16		7/8	7/8	10	2 1/4
567-F	655-D	3.20	1 5/16		7/8	1	10	2 1/4
567-B	655	3.20	1 7/16	7/8		7/8	10	2 1/4
567-C	655-E	3.20	1 7/16	7/8		1	10	2 1/4
568-E	656-A	4.40	1 1/2		1	7/8	11	3 1/4
568-F	656-B	4.40	1 1/2		1	1	11	3 1/4
568	656-C	4.40	1 5/8	1		7/8	11	3 1/4
568-B	656	4.40	1 5/8	1		1	11	3 1/4
568-G	656-D	4.40	1 11/16		1 1/8	1	11	3 1/4
568-C	656-E	4.40	1 13/16	1 1/8		1	11	3 1/4
568-H	656-F	4.40	1 7/8		1 1/4	1	11	3 1/4
568-D	656-G	4.40	2	1 1/4		1	11	3 1/4

HEXAGON BOX WRENCHES

15° Angle, Single Head

For Whitworth Wrenches, see page 142. These Wrenches are finished as described on page 109. Unhardened wrenches are broached only. Packed in cardboard boxes; Nos. 801-A to 804, twelve in a box; Nos. 805-A to 808-A, six in a box.

No.	Price Each		Nominal Size of Opening Across Flats	For U. S. Std. Nut; Size Bolt	For Amer. Std. Nut (Reg.) and Fin. Bolt	Extreme Length Approx.	Outside Diameter of Head Approx.	Approx. Weight Each, Pounds
	Unhardened	Finished						
801-A	$0.30	$0.42	7/16		1/4	4	29/32	1/10
801	.30	.42	1/2	1/4		4	29/32	1/10
802-A	.36	.50	9/16		5/16	4 3/4	1 3/32	1/6
802	.36	.50	19/32	5/16		4 3/4	1 3/32	1/6
803-A	.42	.58	5/8		3/8	5 1/2	1 1/4	1/4
803	.42	.58	11/16	3/8		5 1/2	1 1/4	1/4
804-A	.50	.70	3/4		7/16	6 1/2	1 3/8	1/3
804	.50	.70	25/32	7/16		6 1/2	1 3/8	1/3
805-A	.60	.84	13/16		1/2	7 1/4	1 1/2	3/5
805	.60	.84	7/8	1/2	9/16	7 1/4	1 1/2	3/5
806	.72	1.00	31/32	9/16		8	1 5/8	1/2
806-B	.72	1.00	1		5/8	8	1 5/8	1/2
807	.90	1.24	1 1/16	5/8		9 1/2	1 3/4	4/5
807-A	.90	1.24	1 1/8		3/4	9 1/2	1 3/4	4/5
808	1.16	1.56	1 1/4	3/4		10 3/4	2 1/16	1 1/3
808-A	1.16	1.56	1 5/16		7/8	10 3/4	2 1/16	1 1/3
809	1.56	2.08	1 7/16	7/8		12	2 3/8	1 3/4
809-A	1.56	2.08	1 1/2		1	12	2 3/8	1 3/4
810	2.10	2.80	1 5/8	1		13 1/2	2 5/8	2 1/2
810-A	2.10	2.80	1 11/16		1 1/8	13 1/2	2 5/8	2 1/2
811	2.80	3.70	1 13/16	1 1/8		15	2 7/8	3
811-A	2.80	3.70	1 7/8		1 1/4	15	2 7/8	3
812	3.70	4.80	2	1 1/4		16 1/2	3 1/4	4
812-A	3.70	4.80	2 1/16		1 3/8	16 1/2	3 1/4	4
813	4.70	6.00	2 3/16	1 3/8		18	3 1/2	5
813-A	4.70	6.00	2 1/4		1 1/2	18	3 1/2	5
814	6.00	7.50	2 3/8	1 1/2		20	3 3/4	7

NOTE:—Larger sizes Hexagon Box Wrenches, can be furnished on specification. For Alloy Steel Box Wrenches, see pages 153, 169.

SQUARE BOX WRENCHES

22½° Angle — Single Head

In Stock as listed with Openings for Standard Set Screws.

These Wrenches are finished as described on page 109.

Unhardened Wrenches are broached only.

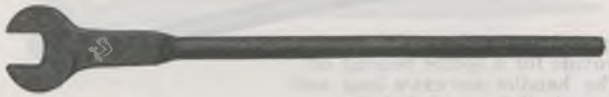
Packed in cardboard boxes; Nos. 581 to 586, twelve in a box; Nos. 587 to 591, six in a box.

New No.	Old No.	PRICE EACH		For Set Screw Size	Extreme Length, Approx.	Approx. Outside Diameter of Head	Approx. Weight Each, Pounds
		Unhardened	Finished				
581	108	$0.24	$0.34	1/4	3 3/8	5/8	1/16
582	109	.28	.40	5/16	3 3/4	23/32	1/8
583	110	.32	.48	3/8	4 1/4	27/32	1/6
584	111	.38	.56	7/16	4 7/8	31/32	1/4
585	112	.46	.68	1/2	5 1/2	1 3/32	1/3
586	113	.56	.82	9/16	6 1/4	1 7/32	1/2
587	114	.70	1.00	5/8	7	1 11/32	5/8
588	115	.88	1.24	3/4	8	1 9/16	3/4
589	116	1.20	1.62	7/8	9	1 3/4	1
590	117	1.60	2.10	1	10	2	1 1/2
591	118	2.06	2.70	1 1/8	11	2 1/4	1 7/8

EXTRA LONG WRENCHES

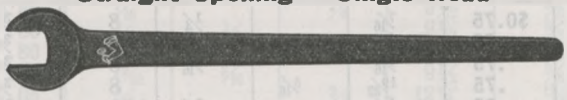
These wrenches are milled and are hardened all over; heads are not ground bright.

EXTRA LONG ROUND HANDLE
Straight Opening — Single Head



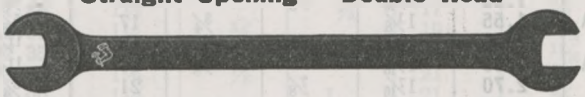
No.	Price Hardened, Each	Nominal Openings Milled	For U. S. Std. Nut; Size Bolt	Extreme Length, Approx.	Approx. Weight Each, Pounds
292	$3.00	7/8	1/2	19	3
293	3.20	1 1/16	5/8	22	4
294	3.20	1 1/4	3/4	22	4
296	4.20	1 7/16	7/8	24	5
297	4.20	1 5/8	1	24	5

EXTRA LONG FLAT HANDLE
Straight Opening — Single Head



272	$4.00	7/8	1/2	19	2 1/2
273	4.70	1 1/16	5/8	22	3 1/2
274	4.70	1 1/4	3/4	22	3 1/2
276	5.50	1 7/16	7/8	24	5
277	5.50	1 5/8	1	24	5

EXTRA LONG FLAT HANDLE
Straight Opening — Double Head

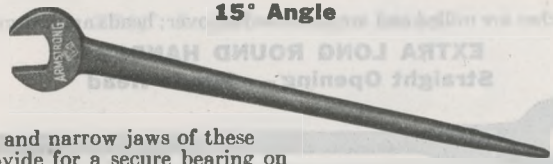


282	$6.70	7/8 & 1 1/16	1/2 & 5/8	19	3 1/2
283	6.70	1 1/16 & 1 1/4	5/8 & 3/4	19	3 1/2
284	7.50	1 1/16 & 1 7/16	5/8 & 7/8	22	5
285	7.50	1 1/4 & 1 7/16	3/4 & 7/8	22	5
286	8.50	1 1/4 & 1 5/8	3/4 & 1	24	6
287	8.50	1 1/16 & 1 5/8	7/8 & 1	24	6

Unhardened wrenches can be furnished at current prices.

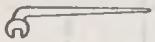
CONSTRUCTION WRENCHES

15° Angle



The deep and narrow jaws of these wrenches provide for a secure bearing on the nut. The handles are extra long and tapered for ease in lining up bolt holes.

Construction wrenches are milled, hardened throughout and sand-blasted; heads are not ground bright.



Wrenches with handles offset at 45° or 90° angle with opening as illustrated at left can be furnished at special prices.

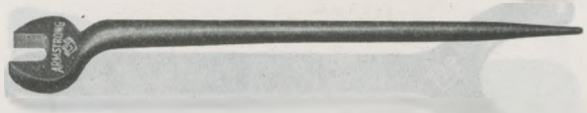
New No.	Old No.	Price Hardened, Each	Nominal Opening Milled	For U. S. Std. Nut; Size Bolt	For Amer. Std. Reg. Nut; Size Bolt	Extreme Length Approx.	Approx. Thickness Head	Approx. Weight Each, Pounds
201-A	221-A	$0.75	7/16		1/4	8	3/8	1/3
201	221	.75	1/2	1/4		8	3/8	1/3
221-B	221-B	.75	9/16		5/16	8	3/8	1/3
202	222	.75	19/32	5/16		8	3/8	1/3
203-A	223-A	.95	5/8		3/8	12	7/16	1/2
203	223	.95	11/16	3/8		12	7/16	1/2
204-A	224-A	.95	3/4		7/16	12	7/16	1/2
204	224	.95	25/32	7/16		12	7/16	1/2
205-A	225-A	1.20	13/16		1/2	14 1/2	17/32	1
205	225	1.20	7/8	1/2	9/16	14 1/2	17/32	1
206	226	1.20	31/32	9/16		14 1/2	17/32	1
206-B	226-B	1.20	1		5/8	14 1/2	17/32	1
207	227	1.55	1 1/16	5/8		17	5/8	1 3/4
207-A	227-A	1.55	1 1/8		3/4	17	5/8	1 3/4
208	228	2.05	1 1/4	3/4		19	11/16	2 7/8
208-A	228-A	2.05	1 5/16		7/8	19	11/16	2 7/8
209	229	2.70	1 7/16	7/8		21	3/4	3 1/2
209-A	229-A	2.70	1 1/2		1	21	3/4	3 1/2
210	230	3.60	1 5/8	1		23	27/32	5 1/8
210-A	230-A	3.60	1 11/16		1 1/8	23	27/32	5 1/8
211	231	5.30	1 13/16	1 1/8		21	1	7 1/2
211-A	231-A	5.30	1 7/8		1 1/4	21	1	7 1/2
212	232	5.30	2	1 1/4		21	1	7 1/2

Unhardened Construction Wrenches can be furnished, when specified, at current prices.

NOTE: For Alloy Steel Construction Wrenches, see page 150.

STRUCTURAL WRENCHES

Straight Opening

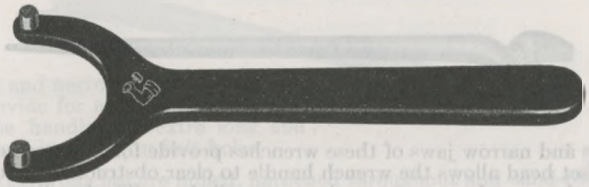


The deep and narrow jaws of these wrenches provide for a secure bearing on the nut. The offset head allows the wrench handle to clear obstructions and enables the user to keep the wrench squarely on the nut at all times. The handles are extra long and tapered for ease in lining up bolt holes. Structural wrenches are milled, hardened throughout and sand-blasted; heads are not ground bright. For Whitworth wrenches, see page 142.

No.	Price Hardened, Each	Nominal Opening	For U. S. Std. Nut; Size Bolt	For Amer. Std. Reg. Nut; Size Bolt	Extreme Length, Approx.	Approx. Thickness Head	Approx. Weight Each, Pounds
901-A	$0.80	7/16		1/4	9 1/2	3/8	1/3
901	.80	1/2	1/4		9 1/2	3/8	1/3
901-B	.80	9/16		5/16	9 1/2	3/8	1/3
902	.80	19/32	5/16		9 1/2	3/8	1/3
903-A	1.05	5/8		3/8	12 1/4	15/32	3/4
903	1.05	11/16	3/8		12 1/4	15/32	3/4
904-A	1.05	3/4		7/16	12 1/4	15/32	3/4
904	1.05	25/32	7/16		12 1/4	15/32	3/4
905-A	1.40	13/16		1/2	14 1/2	17/32	1 1/4
905	1.40	7/8	1/2	9/16	14 1/2	17/32	1 1/4
906	1.40	31/32	9/16		14 1/2	17/32	1 1/4
906-B	1.40	1		5/8	14 1/2	17/32	1 1/4
907	1.85	1 1/16	5/8		17	5/8	2
907-A	1.85	1 1/8		3/4	17	5/8	2
908	2.35	1 1/4	3/4		19	11/16	3 1/4
908-A	2.35	1 5/16		7/8	19	11/16	3 1/4
909	3.00	1 7/16	7/8		21	3/4	4 1/4
909-A	3.00	1 1/2		1	21	3/4	4 1/4
910	4.10	1 5/8	1		23	7/8	5 7/8
910-A	4.10	1 11/16		1 1/8	23	7/8	5 7/8
911	6.15	1 13/16	1 1/8		21	1	7 1/2
911-A	6.15	1 7/8		1 1/4	21	1	7 1/2
912	6.15	2	1 1/4		21	1	7 1/2

Unhardened Structural Wrenches can be furnished, when specified, at current prices.
NOTE:—For Alloy Steel Structural Wrenches, see pages 151-152.

FACE SPANNERS



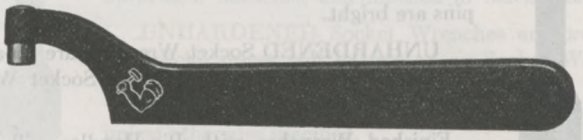
Armstrong drop forged Face Spanners are smoothly burnished, hardened all over and finished in black enamel.

The pins are forged integral with the wrench and are milled to exact sizes listed.

Packed in cardboard boxes; Nos. 418 to 426, twelve in a box; Nos. 428 to 442, six a box.

No.	Price Each Finished	PINS			Span of Jaws in Clear	Approx. Length from Center of Pins	Approx. Weight Each, Pounds
		Distance C to C	Dia. Milled	Length			
418	$0.60	1	3/16	3/16	11/16	4 1/2	1/8
420	.66	1 1/4	7/32	7/32	7/8	5	1/6
422	.74	1 1/2	7/32	7/32	1 1/8	5 1/2	1/6
424	.84	1 3/4	7/32	7/32	1 3/8	6	1/4
426	.96	2	1/4	1/4	1 19/32	6 1/2	1/3
428	1.10	2 1/4	1/4	1/4	1 27/32	7	2/5
430	1.28	2 1/2	9/32	9/32	2 1/32	7 1/2	1/2
432	1.48	2 3/4	9/32	9/32	2 9/32	8	2/3
434	1.70	3	5/16	5/16	2 1/2	8 1/2	3/4
436	1.94	3 1/4	5/16	5/16	2 3/4	9 1/8	5/8
438	2.20	3 1/2	5/16	5/16	3	9 3/4	1
440	2.50	3 3/4	3/8	3/8	3 3/16	10 3/8	1 1/8
442	2.90	4	3/8	3/8	3 1/16	11	

PIN SPANNERS



Armstrong drop forged Pin Spanners are smoothly burnished, hardened all over and finished in black enamel.

The pins are forged integral with the wrench and are milled to exact sizes listed

Packed in cardboard boxes; Nos. 452 to 457, twelve in a box; Nos. 458 to 464, six in a box.

No.	Price Each Finished	For Circle Diameter	Finished Diameter Pin	Extreme Length Approx.	Approx. Weight Each. Pounds
452	$0.54	1	5/16	4	1/12
453	.58	1 1/4	15/64	4 1/2	1/10
454	.60	1 1/2	7/32	5	1/8
455	.62	1 3/4	13/64	5 1/2	1/6
456	.66	2	1/4	6	1/5
457	.70	2 1/4	17/64	6 1/2	1/4
458	.72	2 1/2	9/32	7	1/3
459	.78	2 3/4	19/64	7 1/2	2/5
460	.84	3	5/16	8	1/2
461	.90	3 1/4	21/64	8 1/2	1/2
462	.96	3 1/2	11/32	9	5/8
463	1.02	3 3/4	23/64	9 1/2	2/3
464	1.08	4	3/8	10	3/4
466	1.44	5	7/16	12	1
468	1.96	6	1/2	14	1 3/8

SOCKET WRENCHES

Straight Shank Pattern

FINISHED Socket Wrenches are broached, smoothly burnished, hardened and finished in black baked enamel; pins are bright.

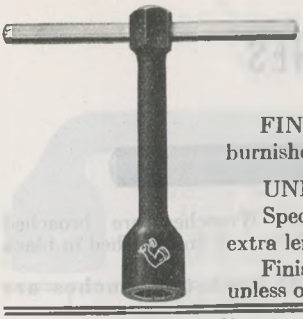
UNHARDENED Socket Wrenches are broached only.

Special prices will be quoted on Socket Wrenches with extra length shanks.

Finished Wrenches with Pin-Handles will be furnished unless otherwise specified.

No.	PRICE EACH				SQUARE OPENINGS				For Set Screw, Size Screw	Extreme Lgth., Approx.	Approx. Diam. Head,	Approx. Wgt. Each, Lbs.
	Unhardened		Finished		Nominal Broached Opening	For U. S. Std. Nut; Size Bolt	For Amer. Std. Nut (Reg.) & Fin'd Bolt	For Cap Screw; Dia. Screw				
	Without Pin-Handle	With Pin-Handle	Without Pin-Handle	With Pin-Handle								
960-H	$0.36	$0.52	$0.54	$0.70	1/8				1/8	3 3/4	5/16	1/16
961-H	.40	.60	.60	.80	3/16				3/16	4 1/4	1/2	1/8
961-J	.40	.60	.60	.80	1/4				1/4	4 1/4	1/2	1/8
962-H	.44	.66	.66	.88	5/16				5/16	4 1/2	5/8	1/8
*963-H	.48	.74	.72	.98	3/8			1/4	3/8	4 7/8	11/16	1/4
965-H	.58	.86	.88	1.16	7/16		1/4	5/16	7/16	5 3/4	7/8	1/2
966-H	.64	.94	.96	1.26	1/2	1/4		3/8	1/2	6 1/8	1	3/4
967-H	.72	1.06	1.08	1.42	9/16		5/16	7/16	9/16	6 1/2	1 1/8	7/8
967-X	.72	1.06	1.08	1.42	19/32	5/16				6 1/2	1 1/8	7/8
968-H	.80	1.14	1.20	1.54	5/8		3/8	1/2	5/8	7	1 1/4	1
†968-P	.80	1.14	1.20	1.54	11/16	3/8		9/16		7	1 1/4	1
969-H	.92	1.28	1.38	1.74	3/4		7/16	5/8	3/4	7 3/8	1 3/8	1 1/4
970-X	1.04	1.44	1.56	1.96	25/32	7/16				7 7/8	1 1/2	1 1/2
970-H	1.04	1.44	1.56	1.96	13/16		1/2			7 7/8	1 1/2	1 1/2
971-H	1.20	1.60	1.80	2.20	7/8	1/2	9/16	3/4	7/8	8 1/4	1 5/8	2
971-X	1.20	1.60	1.80	2.20	31/32	9/16				8 1/4	1 5/8	2
973-H	1.60	2.20	2.40	3.00	1		5/8		1	9 1/8	1 7/8	3
974-X	1.80	2.50	2.70	3.40	1 1/16	5/8				9 1/2	2	3 1/2
974-H	1.80	2.50	2.70	3.40	1 1/8		3/4	7/8	1 1/8	9 1/2	2	3 1/2
976-H	2.30	3.10	3.44	4.24	1 1/4	3/4		1	1 1/4	10 3/8	2 3/8	4 1/2
977-N	2.60	3.50	3.90	4.80	1 3/8			1 1/8		10 7/8	2 5/8	6 1/2
977-X	2.60	3.50	3.90	4.80	1 7/16	7/8				10 7/8	2 5/8	6 1/2
977-P	2.60	3.50	3.90	4.80	1 1/2		1	1 1/4		10 7/8	2 5/8	6 1/2
978-P	3.20	4.10	4.80	5.70	1 5/8	1		1 3/8		11 3/8	2 7/8	6 3/4
979-X	4.20	5.20	6.30	7.30	1 13/16	1 1/8				11 7/8	3	8 1/2
980-X	5.60	6.90	8.40	9.70	2	1 1/4				12 1/2	3 5/16	11

*Old No. 964-H.
†Old No. 968-M.



SOCKET WRENCHES

Straight Shank Pattern

FINISHED Socket Wrenches are broached, smoothly burnished, hardened and finished in black baked enamel.

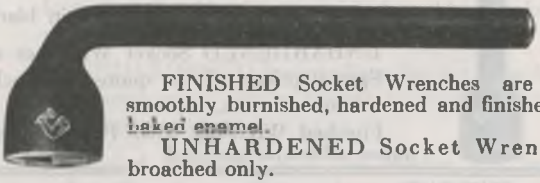
UNHARDENED Socket Wrenches are broached only. Special prices will be quoted on Socket Wrenches with extra length shanks.

Finished Wrenches with Pin-Handles will be furnished unless otherwise specified.

No.	PRICE EACH				HEXAGON OPENINGS							
	Unhardened		Finished									
	Without Pin-Handle	With Pin-Handle	Without Pin-Handle	With Pin-Handle	Nominal Broached Opening	For U. S. Std. Nut; Size Bolt	For Amer Std. Nut (Reg) & Fin'd Bolt	For Cap Screw; Dia. Screw	For S.A.E. Std. Screw and Nut	Extreme Lgth., Approx.	Approx. Diam. Head,	Approx. Wgt. Each, Lbs.
961-A	$0.40	$0.60	$0.60	$0.80	5/16	1/8		1/8		4 1/4	1/2	1/8
962-D	.44	.66	.66	.88	3/8			5/16		4 1/2	5/8	1/5
963-A	.48	.74	.72	.98	13/32	5/16				4 7/8	11/16	1/4
963-D	.48	.74	.72	.98	7/16		1/4	1/4	1/4	4 7/8	11/16	1/4
964-A	.52	.78	.78	1.04	1/2	1/4		5/16	5/16	5 1/4	3/4	1/3
965-D	.58	.86	.88	1.16	9/16		5/16	3/8	3/8	5 3/4	7/8	1/2
965-A	.58	.86	.88	1.16	19/32	5/16				5 3/4	7/8	1/2
966-D	.64	.94	.96	1.26	5/8		3/8	7/16	7/16	6 1/8	1	3/4
967-A	.72	1.06	1.08	1.42	11/16	3/8				6 1/2	1 1/8	7/8
967-D	.72	1.06	1.08	1.42	3/4		7/16	1/2	1/2	6 1/2	1 1/8	7/8
968-A	.80	1.14	1.20	1.54	25/32	7/16				7	1 1/4	1
968-D	.80	1.14	1.20	1.54	13/16		1/2	9/16		7	1 1/4	1
969-A	.92	1.28	1.38	1.74	7/8	1/2	9/16	5/8	9/16	7 3/8	1 3/8	1 1/4
970-S	1.04	1.44	1.56	1.96	15/16				5/8	7 7/8	1 1/2	1 1/2
970-A	1.04	1.44	1.56	1.96	31/32	9/16				7 7/8	1 1/2	1 1/2
970-D	1.04	1.44	1.56	1.96	1		5/8	3/4	11/16	7 7/8	1 1/2	1 1/2
971-A	1.20	1.60	1.80	2.20	1 1/16	5/8			3/4	8 1/4	1 5/8	2
971-D	1.20	1.60	1.80	2.20	1 1/8		3/4	7/8		8 1/4	1 5/8	2
973-A	1.60	2.20	2.40	3.00	1 1/4	3/4		1	7/8	9 1/8	1 7/8	3
973-B	1.60	2.20	2.40	3.00	1 5/16		7/8			9 1/8	1 7/8	3
974-D	1.80	2.50	2.70	3.40	1 3/8			1 1/8		9 1/8	1 7/8	3 1/2
975-A	2.00	2.70	3.00	3.70	1 7/16	7/8			1	10	2 1/8	4
975-D	2.00	2.70	3.00	3.70	1 1/2		1	1 1/4		10	2 1/8	4
976-A	2.30	3.10	3.44	4.24	1 5/8	1		1 3/8	1 1/8	10 3/8	2 3/8	4 1/2
976-B	2.30	3.10	3.44	4.24	1 11/16		1 1/8			10 3/8	2 3/8	4 1/2
977-A	2.60	3.50	3.90	4.80	1 13/16	1 1/8			1 1/4	10 7/8	2 5/8	6 1/2
977-B	2.60	3.50	3.90	4.80	1 7/8		1 1/4			10 7/8	2 5/8	6 1/2
978-A	3.20	4.10	4.80	5.70	2	1 1/4			1 3/8	11 3/8	2 7/8	6 3/4
978-B	3.20	4.10	4.80	5.70	2 1/16		1 3/8			11 3/8	2 7/8	6 3/4
979-A	4.20	5.20	6.30	7.30	2 3/16	1 3/8			1 1/2	11 7/8	3	8 1/2
979-B	4.20	5.20	6.30	7.30	2 1/4		1 1/2			11 7/8	3	8 1/2
980-A	5.60	6.90	8.40	9.70	2 3/8	1 1/2				12 1/2	3 5/16	11

SOCKET WRENCHES

Offset Pattern



FINISHED Socket Wrenches are broached smoothly burnished, hardened and finished in black baked enamel.

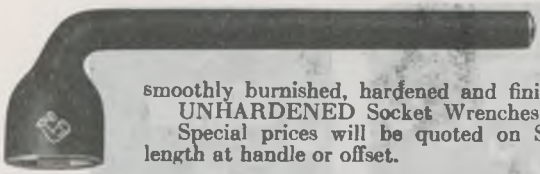
UNHARDENED Socket Wrenches are broached only.

Special prices will be quoted on Socket Wrenches with extra length at handle or offset.

New No.	Old No.	PRICE EACH		SQUARE OPENINGS					Extreme Lgth., Approx.	Approx. Diam. Head,	Approx. Wt. Each, Lbs.
		Unhardened	Finished	Nominal Broached Opening	For U. S. Std. Nut; Size Bolt	For Amer. Std. Nut (Reg.) & Fin'd Bolt	For Cap Screw; Dia. Screw	For Set Screw, Size Screw			
260-H	860-H	$0.36	$0.54	1/8				1/8	2 3/4	5/16	1/16
261-H	861-H	.40	.60	3/16				3/16	3 3/4	1/2	1/8
261-J	861-J	.40	.60	1/4				1/4	3 3/4	1/2	1/8
262-H	862-H	.44	.66	5/16				5/16	4 1/2	5/8	1/4
263-H	864-H	.48	.72	3/8			1/4	3/8	5 1/2	11/16	1/3
265-H	865-H	.58	.88	7/16		1/4	5/16	7/16	6 1/2	7/8	7/16
266-H	866-H	.64	.96	1/2	1/4		3/8	1/2	6 1/2	1	7/16
267-H	867-H	.72	1.08	9/16		5/16	7/16	9/16	7 1/4	1 1/8	5/8
267-X	867-X	.72	1.08	19/32	5/16				7 1/4	1 1/8	5/8
268-H	868-H	.80	1.20	5/8		3/8	1/2	5/8	8	1 1/4	1
268-P	868-M	.80	1.20	11/16	3/8		9/16		8	1 1/4	1
269-H	869-H	.92	1.38	3/4		7/16	5/8	3/4	8 3/8	1 3/8	1
270-X	870-X	1.04	1.56	25/32	7/16				9 1/8	1 1/2	1 1/4
270-H	870-H	1.04	1.56	13/16		1/2			9 1/8	1 1/2	1 1/4
271-H	871-H	1.20	1.80	7/8	1/2	9/16	3/4	7/8	10	1 5/8	1 3/4
271-X	872-X	1.20	1.80	31/32	9/16				10	1 5/8	1 3/4
273-H	873-H	1.60	2.40	1		5/8		1	11 5/8	1 7/8	2 1/2
274-X	874-X	1.80	2.70	1 1/16	5/8				12 3/8	2	2 1/2
274-H	874-H	1.80	2.70	1 1/8		3/4	7/8	1 1/8	12 3/8	2	2 1/2
276-H	876-H	2.30	3.44	1 1/4	3/4		1	1 1/4	14 7/8	2 3/8	3 3/4
277-N	877-H	2.60	3.90	1 3/8			1 1/8		16 1/2	2 5/8	6
277-X	877-X	2.60	3.90	1 7/16	7/8				16 1/2	2 5/8	6
277-P	877-M	2.60	3.90	1 1/2		1	1 1/4		16 1/2	2 5/8	6
278-P	878-H	3.20	4.80	1 5/8	1		1 3/8		18 1/4	2 7/8	8 1/8
279-X	879-H	4.20	6.30	1 15/16	1 1/8				20	3	10
280-X	880-H	5.60	8.40	2	1 1/4				21 3/4	3 5/16	12 1/4

SOCKET WRENCHES

Offset Pattern



FINISHED Socket Wrenches are broached, smoothly burnished, hardened and finished in black baked enamel.

UNHARDENED Socket Wrenches are broached only.

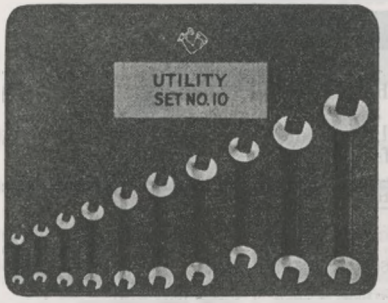
Special prices will be quoted on Socket Wrenches with extra length at handle or offset.

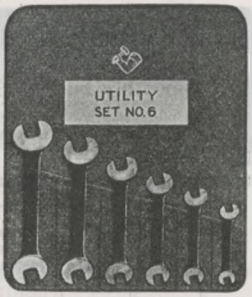
New No.	Old No.	PRICE EACH		HEXAGON OPENINGS					Extreme Lgth., Approx.	Approx. Dia. Head	Approx. Wgt. Each, Lbs.
		Unhardened	Finished	Nominal Broached Opening	For U. S. Std. Nut Size Bolt	For Amer. Std. Nut (Reg.) & Fin'd Bolt	For Cap Screw, Dia. Screw	For S. A. E. Std. Screw and Nut, Size Bolt			
261-A	861-A	$0.40	$0.60	5/16	1/8				3 3/4	1/2	1/8
262-D	862-D	.44	.66	3/8			3/16		4 1/2	5/8	1/8
263-A	863-A	.48	.72	13/32	3/16				4 1/2	11/16	1/8
263-D	863-D	.48	.72	7/16		1/4	1/4	1/4	4 1/2	11/16	1/8
264-A	864-A	.52	.78	1/2	1/4		5/16	5/16	5 1/2	3/4	1/4
265-D	865-D	.58	.88	9/16		5/16	3/8	3/8	6 1/2	7/8	3/8
265-A	865-A	.58	.88	19/32	5/16				6 1/2	7/8	3/8
266-D	866-D	.64	.96	5/8		3/8	7/16	7/16	6 1/2	1	3/8
267-A	867-A	.72	1.08	11/16	3/8				7 1/4	1 1/8	5/8
267-D	867-D	.72	1.08	3/4		7/16	1/2	1/2	7 1/4	1 1/8	5/8
268-A	868-A	.80	1.20	25/32	7/16				8	1 1/4	7/8
268-D	868-D	.80	1.20	13/16		1/2	9/16		8	1 1/4	7/8
269-A	869-A	.92	1.38	7/8	1/2	9/16	5/8	9/16	8 3/8	1 3/8	7/8
270-S	870-S	1.04	1.56	15/16				5/8	9 1/8	1 1/2	1 1/4
270-A	870-A	1.04	1.56	31/32	9/16				9 1/8	1 1/2	1 1/4
270-D	870-D	1.04	1.56	1		5/8	3/4	11/16	9 1/8	1 1/2	1 1/4
271-A	871-A	1.20	1.80	1 1/16	5/8			3/4	10	1 5/8	1 5/8
271-D	872-D	1.20	1.80	1 1/8		3/4	7/8		10	1 5/8	1 5/8
273-A	873-A	1.60	2.40	1 1/4	3/4		1	7/8	11 3/8	1 7/8	2 1/8
273-B	873-B	1.60	2.40	1 5/32		7/8			11 5/8	1 7/8	2 1/4
274-D	874-D	1.80	2.70	1 3/8			1 1/8		12 3/8	1 7/8	2 1/8
275-A	875-A	2.00	3.00	1 7/16	7/8			1	13 1/4	2 1/8	3 1/2
275-D	875-D	2.00	3.00	1 1/2		1	1 1/4		13 1/4	2 1/8	3 1/2
276-A	876-A	2.30	3.44	1 5/8	1		1 3/8	1 1/8	14 7/8	2 3/8	4 1/2
276-B	876-B	2.30	3.44	1 11/16		1 1/8			14 7/8	2 3/8	4 1/2
277-A	877-A	2.60	3.90	1 13/16	1 1/8			1 1/4	16 1/2	2 5/8	6
277-B	877-B	2.60	3.90	1 7/8		1 1/4			16 1/2	2 5/8	6
278-A	878-A	3.20	4.80	2	1 1/4			1 3/8	18 1/4	2 7/8	8 1/8
278-B	878-B	3.20	4.80	2 1/16		1 3/8			18 1/4	2 7/8	8 1/8
279-A	879-A	4.20	6.30	2 3/16	1 3/8			1 1/2	20	3	10
279-B	879-B	4.20	6.30	2 1/4		1 1/2			20	3	10
280-A	880-A	5.60	8.40	2 3/8	1 1/2				21 3/4	3 5/16	12 1/2

NOTE—For Alloy Steel Socket Wrenches, see page 157.

ARMSTRONG WRENCH SETS

No Duplication of Openings





EXTRA RANGE "UTILITY" SET NO. 10

15° Angle. Carefully selected because of utility, capacity, range and service for Machine Shops, Tool Rooms, Factories, Garages, Printing Establishments and general use.

New No.	Old No.	Price Each Finished	Nominal Openings Milled,	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts (Reg) and Finished Bolts	For Hex. Head Cap Screws, Dia. Screws	For S. A. E. Std. Nuts and Cap Screws, Size Bolts	Extreme Lgth., Approx.
21	21	$0.34	5/16 & 13/32	1/8 & 3/16		1/8		4 1/8
723	23-A	.42	3/8 & 7/16		1/4	3/16 & 1/4	1/4	4 1/2
25	25	.50	1/2 & 19/32	1/4 & 5/16		5/16	5/16	5 1/2
727	27-A	.62	9/16 & 5/8		5/16 & 3/8	3/8 & 7/16	3/8 & 7/16	6
29	29	.74	11/16 & 25/32	3/8 & 7/16				7 1/2
731	31-A	.90	3/4 & 13/16		7/16 & 1/2	1/2 & 9/16	1/2	9
733	33-A	1.10	7/8 & 1	1/2	9/16 & 5/8	5/8 & 3/4	9/16 & 11/16	10
35	35	1.36	31/32 & 1 1/16	9/16 & 5/8			3/4	11
738	37-S	1.92	1 1/8 & 1 3/8		3/4	7/8 & 1 1/8		12 1/2
39	39	2.80	1 1/4 & 1 7/16	3/4 & 7/8		1	7/8 & 1	13 1/2
Price, Complete Set in cardboard box, Weight of Set 9 1/2 lbs								$10.70
Ten Wrenches... in roll								12.20

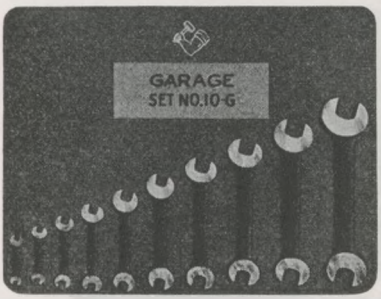
"UTILITY" SET NO. 6

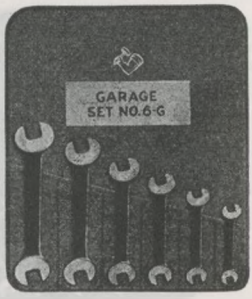
15° Angle. 12 openings, no duplicates.

725	25-A	$0.50	7/16 & 1/2	1/4	1/4	1/4 & 5/16	1/4 & 5/16	5
727	27-A	.62	9/16 & 5/8		5/16 & 3/8	3/8 & 7/16	3/8 & 7/16	6
28	28	.74	19/32 & 21/32	5/16 & 7/16				7
30	30	.90	11/16 & 7/8	3/8 & 1/2	9/16	5/8	9/16	8
32-A	32-A	1.10	3/4 & 1		7/16 & 1	1/2 & 3/4	1/2	10
37	37	1.92	1 1/16 & 1 1/4	5/8 & 3/4		1	3/4 & 7/8	12 1/2
Price, Complete Set in cardboard box, Weight of Set 5 1/4 lbs								$5.78
Six Wrenches... in roll								6.78

ARMSTRONG WRENCH SETS

For Automative Use





"EXTRA RANGE" GARAGE SET NO. 10-G

15° Angle. Fits 70 different Automobile Nuts and Screws. No duplicates.

New No.	Old No.	Price Each Finished	Nominal Openings Milled,	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts (Reg.) and Finished Bolts	For Hex. Head Cap Screws, Dia. Screws	For S. A. E. Std Nuts and Cap Screws, Size Bolts	Extreme Lgth., Approx.
721-A	21-A	$0.34	5/16 & 3/8	1/8		1/8 & 3/16		4 1/8
23	23	.42	15/32 & 1/2	5/16 & 1/4		5/16	5/16	4 3/4
725-A	25-B	.50	7/16 & 9/16		1/4 & 5/16	1/4 & 3/8	1/4 & 3/8	5
27	27	.62	17/32 & 11/16	5/16 & 3/8				6 1/2
729	29-A	.74	5/8 & 3/4		3/8 & 7/16	7/16 & 1/2	7/16 & 1/2	7
731-B	31-C	.90	13/16 & 7/8	1/2	1/2 & 9/16	9/16 & 5/8	9/16	9
32	32	1.10	25/32 & 31/32	7/16 & 9/16				10
33-C	33-C	1.10	15/16 & 1		5/8	3/4	5/8 & 11/16	10
737	37-A	1.92	1 1/8 & 1 1/4	3/4	3/4	7/8 & 1	7/8	12 1/2
38	38	2.80	1 1/16 & 1 1/16	5/8 & 7/8			3/4 & 1	13 1/2

Price, Complete Set { in cardboard box, Weight of Set 9 1/4 lbs..... $10.44
Ten Wrenches... { in roll..... 11.94

"HANDY" GARAGE SET NO. 6-G

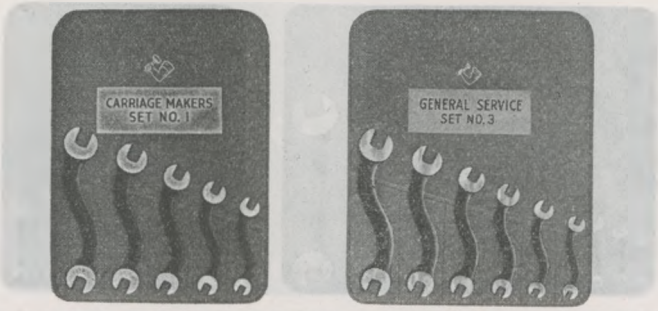
15° Angle. Fits 40 different Nuts and Screws most used on automobiles.

23	23	$0.42	15/32 & 1/2	5/16 & 1/4		5/16	5/16	4 3/4
25-A	25-B	.50	7/16 & 9/16		1/4 & 5/16	1/4 & 3/8	1/4 & 3/8	5
27	27	.62	17/32 & 11/16	5/16 & 3/8				6 1/2
29	29-A	.74	5/8 & 3/4		3/8 & 7/16	7/16 & 1/2	7/16 & 1/2	7
31-B	31-C	.90	13/16 & 7/8	1/2	1/2 & 9/16	9/16 & 5/8	9/16	9
33-C	33-C	1.10	15/16 & 1		5/8	3/4	5/8 & 11/16	10

Price, Complete Set { in cardboard box, Weight of Set 3 1/2 lbs..... $4.28
Six Wrenches.... { in roll..... 5.28

ARMSTRONG WRENCH SETS

22½° Angle, for General Use



LIGHT "S" CARRIAGE MAKERS' SET NO. 1

New No.	Old No.	Price Each Finished	Nominal Openings Milled	For Manufacturers' Std. Nuts; Size Bolts	For U. S. Std. Nut, Size Bolt	For Hex. Head Cap Screws, Dia. Screws	For S. A. E. Std. Nut and Cap Screw, Size Bolt	Extreme Lgth., Approx.
75	475	$0.54	13/32 & 1/2	3/16 & 1/4	3/16 & 1/4	5/16	5/16	6¼
77	477	.68	1/2 & 5/8	1/4 & 5/16	1/4	5/16 & 7/16	5/16 & 7/16	7⅛
79	479	.86	5/8 & 11/16	5/16 & 3/8	3/8	7/16	7/16	8¼
81	481	1.10	11/16 & 27/32	3/8 & 7/16	3/8			9¼
83	483	1.40	21/32 & 15/16	7/16 & 1/2			5/8	10⅜

Price, Complete Set (in cardboard box, Weight 2¾ lbs. $4.58
Five Wrenches... (in roll 5.58

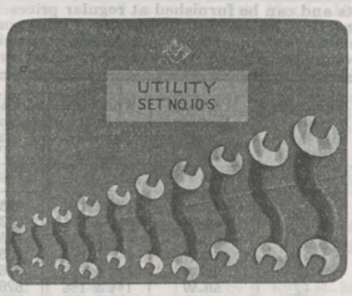
LIGHT "S" GENERAL SERVICE SET NO. 3

New No.	Old No.	Price Each Finished	Nominal Openings Milled,	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts (Reg.) and Finished Bolts	For Hex. Head Cap Screws, Dia. Screws	For S. A. E. Std. Nuts and Cap Screws, Size Bolts	Extreme Lgth. Approx.
75-B	475-B	$0.54	3/8 & 7/16		1/4	3/16 & 1/4	1/4	6¼
77-B	477-B	.68	1/2 & 9/16	1/4	5/16	5/16 & 3/8	5/16 & 3/8	7⅛
79	479	.86	5/8 & 11/16	3/8	3/8	7/16	7/16	8¼
81-B	481-B	1.10	3/4 & 13/16		7/16 & 1/2	1/2 & 9/16	1/2	9¼
83-B	483-B	1.40	7/8 & 1	1/2	9/16 & 5/8	5/8 & 3/4	9/16 & 11/16	10⅜
85-B	485-B	2.00	1⅛ & 1¼	3/4	3/4	7/8 & 1	7/8	12

Price, Complete Set (in cardboard box, Weight 5¼ lbs. $6.58
Six Wrenches... (in roll 7.58

ARMSTRONG WRENCH SETS

22½° Angle



LIGHT "S" HANDY SET NO. 6-S

New No.	Old No.	Price Each Finished	Nominal Openings Milled,	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts (Reg) and Finished Bolts	For Hex. Head Cap Screws, Dia. Screws	For S. A. E. Std. Nuts and Cap Screws, Size Bolts	Extreme Lgth., Approx
75-A	475-A	$0.54	3/8 & 1/2	1/4		3/16 & 5/16	5/16	6¼
77	477	.68	1/2 & 5/8	1/4	3/8	5/16 & 7/16	5/16 & 7/16	7⅛
79-C	479-E	.86	5/8 & 3/4	3/8 & 7/16	7/16 & 1/2	7/16 & 1/2	7/16 & 1/2	8¼
81-A	481-A	1.10	3/4 & 7/8	1/2	7/16 & 9/16	1/2 & 5/8	1/2 & 9/16	9¼
83-B	483-B	1.40	7/8 & 1	1/2	9/16 & 5/8	5/8 & 3/4	9/16 & 11/16	10⅜
Price, Complete Set in cardboard box, Weight 2¼ lbs								$4.58
Five Wrenches... in roll								5.38

HEAVY "S" UTILITY SET NO. 10-S

22½° Angle. An exceptionally strong, handy, well assorted Set of "S" Wrenches. Carefully selected because of utility, capacity, range and service for Machine Shops, Tool Rooms, Factories, Printing Establishments and general use. 20 openings, no duplicates.

661-A	$0.44	5/16 & 13/32	1/8			1/8 & 3/16		4
661-F	.44	3/8 & 7/16		1/4		3/16 & 1/4	1/4	4
662-B	.58	1/2 & 19/32	1/4 & 5/16			5/16	5/16	5
663-D	.78	9/16 & 5/8		5/16 & 3/8		3/8 & 7/16	3/8 & 7/16	6¼
663-C	.78	11/16 & 23/32	3/8 & 7/16					6¼
664-D	1.06	3/4 & 13/16		7/16 & 1/2		1/2 & 9/16	1/2	7½
665-E	1.44	7/8 & 1	1/2	9/16 & 5/8		5/8 & 3/4	9/16 & 11/16	9
665-C	1.44	31/32 & 1 1/16	9/16 & 5/8				3/4	9
666-F	2.00	1 1/8 & 1 3/8		3/4		7/8 & 1 1/8		10½
667-A	2.90	1¼ & 1 7/16	3/4 & 7/16			1	7/8 & 1	12
Price, Complete Set in cardboard box, Weight 11 lbs								$11.86
Ten Wrenches... in roll								13.36

WHITWORTH STANDARD WRENCHES

Stock Shapes and Sizes

The Wrenches listed beneath are ordinarily carried in stock with openings milled for Whitworth Standard Nuts and can be furnished at regular prices.

When ordering be careful to specify "Whitworth" and catalog number. U. S. Standard Wrenches are always shipped when not otherwise specified in order.

For the complete listing of Whitworth Standard Wrenches, see the British edition of our catalog.

Catalog Number and Page	Fitting Whitworth Nut Size Bolt, Inches
Page 110-111	
00-W	1/8
0-W	5/32
1-W	1/4
2-W	5/16
3-W	3/8
4-W	7/16
5-W	1/2
6-W	9/16
7-W	5/8
8-W	11/16
9-W	3/4
10-W	1
11-W	1 1/16
12-W	1 1/4
13-W	1 3/8
14-W	1 1/2
15-W	1 5/8
16-W	1 3/4
16½-W	1 7/8
17-W	2
18-W	2 1/4
19-W	2 1/2
19½-W	2 3/4
20-W	3
Page 112-114	
21-W	1/8 & 5/32
22-W	1/8 & 1/4
23-W	5/32 & 1/4
24-W	5/32 & 5/16
25-W	1/4 & 5/16
26-W	1/4 & 3/8
27-W	5/16 & 3/8
28-W	5/16 & 7/16
29-W	3/8 & 7/16
30-W	3/8 & 1/2
31-W	7/16 & 1/2
32-W	7/16 & 9/16
33-W	1/2 & 9/16
34-W	1/2 & 5/8
35-W	9/16 & 5/8
36-W	9/16 & 3/4
37-W	5/8 & 3/4
38-W	5/8 & 7/8
39-W	3/4 & 7/8
40-W	3/4 & 1
41-W	7/8 & 1
42-W	7/8 & 1 1/8
43-W	1 & 1 1/4
44-W	1 & 1 1/4

Catalog Number and Page	Fitting Whitworth Nut Size Bolt, Inches
Page 114	
45-W	1 1/8 & 1 1/4
46-W	1 1/8 & 1 3/8
47-W	1 1/4 & 1 3/8
48-W	1 1/4 & 1 1/2
49-W	1 3/8 & 1 1/2
50-W	1 3/8 & 1 5/8
51-W	1 1/2 & 1 5/8
52-W	1 1/2 & 1 3/4
53-W	1 5/8 & 1 3/4
54-W	1 5/8 & 2
55-W	1 3/4 & 2
56-W	1 3/4 & 2 1/4
57-W	2 & 2 1/4
Page 115	
760-C-W	1/8 & 1/4
760-A-W	5/32 & 1/4
760-B-W	5/32 & 5/16
761-A-W	1/4 & 5/16
761-C-W	1/4 & 3/8
761-B-W	5/16 & 3/8
762-C-W	5/16 & 7/16
762-A-W	3/8 & 7/16
762-B-W	3/8 & 1/2
763-A-W	7/16 & 1/2
763-C-W	7/16 & 9/16
763-B-W	1/2 & 9/16
764-A-W	1/2 & 5/8
764-B-W	9/16 & 5/8
764-C-W	9/16 & 3/4
765-A-W	5/8 & 3/4
765-B-W	5/8 & 7/8
765-W	3/4 & 7/8
Page 116	
600-W	3/16
601-W	1/4
602-W	5/16
603-W	3/8
604-W	7/16
605-W	1/2
606-W	9/16
607-W	5/8
608-W	3/4
609-W	7/8
610-W	1

Catalog Number and Page	Fitting Whitworth Nut Size Bolt, Inches
Page 117	
623-W	3/16 & 1/4
623-A-W	5/16 & 5/16
623-B-W	1/4 & 5/16
626-W	1/4 & 3/8
626-A-W	5/16 & 3/8
626-B-W	5/16 & 7/16
629-W	3/8 & 7/16
629-A-W	3/8 & 1/2
629-B-W	7/16 & 1/2
632-W	7/16 & 9/16
632-A-W	1/2 & 9/16
632-B-W	1/2 & 5/8
635-W	9/16 & 5/8
635-A-W	5/16 & 3/4
635-B-W	5/8 & 3/4
638	5/8 & 7/8
638-A-W	3/4 & 7/8
638-B-W	3/4 & 1
Page 120	
75-W	3/16 & 1/4
77-C-W	1/4 & 7/16
79-C-W	5/16 & 7/16
81-C-W	3/8 & 7/16
81-B-W	3/8 & 1/2
83-C-W	7/16 & 1/2
83-A-W	7/16 & 9/16
83-B-W	1/2 & 9/16
85-D-W	1/2 & 5/8
85-A-W	9/16 & 5/8
85-B-W	9/16 & 3/4
85-C-W	5/8 & 3/4
Page 127	
801-W	1/4
802-W	5/16
803-W	3/8
804-W	7/16
805-W	1/2
806-W	9/16
807-W	5/8
808-W	3/4
809-W	7/8
810-W	1
811-W	1 1/8
812-W	1 1/4
813-W	1 3/8
814-W	1 1/2

Catalog Number and Page	Fitting Whitworth Nut Size Bolt, Inches
Page 131	
901-W	1/4
902-W	5/16
903-W	3/8
904-W	7/16
905-W	1/2
906-W	9/16
907-W	5/8
908-W	3/4
909-W	7/8
910-W	1
910-A	1 1/8
911-W	1 1/4
912-W	1 1/4
Page 147-148	
1021-W	1/8 & 5/16
1022-W	1/8 & 1/4
1023-W	5/16 & 1/4
1024-W	5/16 & 5/16
1025-W	1/4 & 5/16
1026-W	1/4 & 3/8
1027-W	5/16 & 3/8
1028-W	5/16 & 7/16
1029-W	3/8 & 7/16
1030-W	3/8 & 1/2
1031-W	7/16 & 1/2
1032-W	7/16 & 9/16
1033-W	1/2 & 9/16
1034-W	1/2 & 5/8
1235-W	9/16 & 5/8
1036-W	9/16 & 3/4
1037-W	5/8 & 3/4
Page 165	
8723-W	1/8 & 3/16
8725-W	1/4 & 5/16
8028-W	5/16 & 3/8
8033-W	7/16 & 1/2
8035-W	9/16 & 5/8

METRIC STANDARD WRENCHES

Stock Shapes and Sizes

The Wrenches listed beneath are ordinarily carried in stock with Metric Measure Milled Openings and can be furnished at regular prices.

When ordering be careful to specify "Metric" and catalog number. U. S. Standard Wrenches are always shipped when not otherwise specified in order.

For the complete listing of Metric Standard Wrenches, see the British edition of our Catalog.

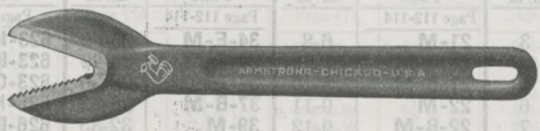
Catalog Number and Page	Metric Size Opening m/m	Catalog Number and Page	Metric Size Opening m/m	Catalog Number and Page	Metric Size Opening m/m	Catalog Number and Page	Metric Size Opening m/m
Page 110-14		Page 112-114		Page 112-114		Page 118	
00-B-M	3	21-M	6-8	34-E-M	25-30	623-M	10-12
00-C-M	4	21-B-M	7-9	34-F-M	26-29	623-B-M	10-14
00-D-M	5	21-C-M	8-10	37-M	28-30	623-C-M	12-15
00-E-M	6	22-M	9-11	37-B-M	29-32	626-M	13-16
00-F-M	7	22-B-M	9-12	39-M	32-35	626-B-M	14-17
00-M	8	22-C-M	10-11	40-M	33-39	626-C-M	15-18
00-G-M	9	23-M	10-12	40-B-M	35-38	629-B-M	16-19
0-M	10	24-M	10-14	41-M	38-40	629-C-M	17-22
01-M	11	25-B-M	11-16	42-M	42-45	629-M	18-20
1-M	12	25-M	12-14	44-M	46-49	629-D-M	18-21
1-B-M	13	25-C-M	12-15	45-M	46-50	632-B-M	20-22
2-M	14	25-D-M	12-16	47-M	50-55	632-C-M	21-23
2-B-M	15	25-B-M	13-15			632-M	22-25
3-M	16	25-F-M	13-16	Page 118		632-E-M	23-26
3-B-M	17	27-M	14-16	600-B-M	4	635-B-M	22-28
3-C-M	18	27-B-M	14-17	600-C-M	5	635-C-M	24-28
3-D-M	19	27-C-M	14-18	600-D-M	6	635-M	28-30
4-M	20	27-D-M	15-18	600-F-M	7		
4-B-M	21	28-B-M	16-19	600-F-M	8		
5-M	22	28-M	16-18	600-G-M	9	Page 118-119	
5-B-M	23	28-C-M	16-20	600-H-M	10		
5-C-M	24	28-D-M	17-19	601-M	11	661-A-M	6-8
6-M	25	28-E-M	17-20	601-A-M	12	661-C-M	10-12
6-B-M	26	29-M	18-20	601-B-M	13	662-C-M	14-16
6-C-M	27	29-B-M	18-21	602-M	14	663-C-M	18-20
7-M	28	29-C-M	19-21	602-B-M	15	664-F-M	22-25
7-B-M	29	30-M	16-22	603-M	16	665-C-M	28-30
7-C-M	30	30-B-M	17-22	603-A-M	17	666-F-M	32-35
8-M	31	31-M	20-22	604-M	18	667-C-M	38-40
8-B-M	32	31-B-M	20-23	604-A-M	19	668-A-M	42-45
8-C-M	33	31-C-M	21-23	604-B-M	20		
9-M	34	33-M	22-25	605-M	21	Page 120	
9-B-M	36	33-B-M	23-25	605-A-M	22		
9-C-M	38	33-C-M	23-26	606-M	23	75-M	10-12
9-D-M	39	34-M	22-28	606-A-M	24	79-C-M	14-16
10-M	40	34-B-M	23-27	607-M	25	81-C-M	18-20
10-B-M	42	34-C-M	23-28	608-M	30	83-M	22-25
11-M	45	34-D-M	24-28	609-M	32	85-C-M	28-30

"ALLIGATOR TYPE" WRENCHES

These Wrenches are drop forged from High Carbon Steel and tempered in oil. The teeth are carefully milled.

Our "Alligator Type" Wrenches are of uniform design and of superior material and workmanship.

SINGLE END



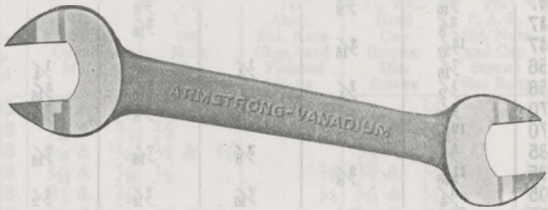
No.	Length Inches	Holds Pipe Inches	Holds Round Iron Inches	Weight Each Pounds	Price Each	No.
0	6	1/8 to 3/8	1/4 to 5/8	3/8	$0.50	0
1	7 1/2	1/8 to 1/2	5/16 to 3/4	1/2	.70	1
2	9	1/4 to 3/4	7/16 to 1	1	1.00	2
2 1/2	12	3/8 to 1	5/8 to 1 1/4	1 3/4	1.50	2 1/2
3	15	1/2 to 1 1/4	3/4 to 1 1/2	3	2.00	3
3 1/2	18	3/4 to 1 1/2	1 to 1 3/4	4	2.50	3 1/2
4	21	1 to 2	1 1/4 to 2 1/2	7 1/2	3.00	4
4 1/2	24	1 1/4 to 2 1/2	1 1/2 to 3	9 3/4	4.00	4 1/2
5	27	1 1/2 to 3	2 1/4 to 3 1/2	13	5.00	5

DOUBLE END

No.	Length Inches	Holds Pipe Inches	Holds Round Iron Inches	Weight Each Pounds	Price Each	No.
8	8	1/8 to 1/2	1/4 to 1/2	1/2	$1.00	8
10	10	1/8 to 3/4	1/4 to 1	1	1.50	10
12	12	1/4 to 1	3/8 to 1 1/4	1 1/2	2.00	12

ARMSTRONG VANADIUM SUPER QUALITY DROP FORGED WRENCHES

The Armstrong Alloy Steel Wrench, made extra long and light with smaller and thinner heads, was first introduced to the trade in 1919, and their superior qualities immediately were recognized by discriminating buyers and wrench users since the use of Alloy Steel enabled us to make wrenches which were longer, lighter, less bulky and at the same time stronger than any drop forged wrench previously available. Since then the demand for these super quality wrenches has increased until wrenches made from alloy steel are rapidly becoming standard equipment where extra strength and length are required.



These wrenches are extremely long and light as compared to their capacity. The jaws are thin and narrow and can get at the nut that is placed in close quarters.

Their strength is not based upon bulk but upon excellence of design and material They are drop forged from Chrome-Vanadium steel, heat treated.

FINISHED wrenches are milled, smoothly burnished, heat treated and finished in Chrome over Nickel. The wrench heads are buffed bright and plainly stamped with catalog number and nominal size of opening. All openings are milled slightly larger than nominal listed sizes to allow for proper clearance.

UNFINISHED wrenches are the same as above except that they are gray enameled all over; heads are not bright.

Armstrong Vanadium Wrenches will not spread or break.

ENGINEERS' WRENCHES

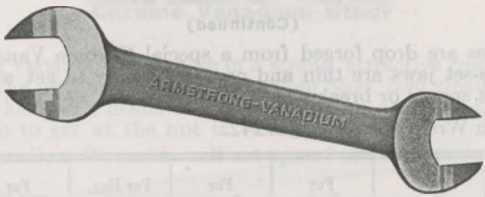
15° Angle, Single Head
Chrome Vanadium Steel

FINISHED—Chrome over Nickel, with heads buffed bright.
UNFINISHED—Gray enameled all over; heads not bright.
Packed, Nos. 1000 to 1003, twelve in a box; Nos. 1704 to 1708-A, six in a box.

No.	Price Each		Nominal Opening Milled	For U. S. Std Nut; Size Bolt	For Amer. Std. Nut (Reg.) and Finished Bolt	For Hex. Head Cap Screw; Dia. Screw	For S. A. E. Std. Nut and Cap Screw Size Bolt	Extreme Lgth., App.	App. Thickness Head	App. Wgt. Each, Lbs.
	Unfinished	Finished								
1000	$0.33	$0.47	5/16	1/8		1/8		3 1/2	1/4	1/16
1700	.33	.47	3/8			3/16		3 1/2	1/4	1/12
1000-A	.33	.47	13/32	3/16				3 1/2	1/4	1/12
1701	.39	.56	7/16		1/4	1/4	1/4	4 1/2	5/16	1/8
1001	.39	.56	1/2	1/4		5/16	5/16	4 1/2	5/16	1/8
1702	.50	.70	9/16		5/16	3/8	3/8	5 1/2	11/32	1/4
1002	.50	.70	19/32	5/16				5 1/2	11/32	1/4
1703	.62	.85	5/8		3/8	7/16	7/16	6 1/2	3/8	1/3
1003	.62	.85	11/16	3/8				6 1/2	3/8	1/3
1704	.78	1.05	3/4		7/16	1/2	1/2	7 1/8	3/8	1/2
1004	.78	1.05	25/32	7/16				7 1/8	3/8	1/2
1705	.96	1.25	13/16		1/2	9/16		8 1/4	7/16	3/8
1005	.96	1.25	7/8	1/2	9/16	5/8	9/16	8 1/4	7/16	3/8
1006-B	1.16	1.50	15/16				5/8	9	1/2	1
1006	1.16	1.50	31/32	9/16				9	1/2	1
1706	1.16	1.50	1		5/8	3/4	11/16	9	1/2	1
1007	1.47	1.88	1 1/16	5/8			3/4	10 1/2	17/32	1 1/4
1707	1.47	1.88	1 1/8		3/4	7/8		10 1/2	17/32	1 1/4
1008	2.00	2.50	1 1/4	3/4		1	7/8	11	11/16	1 3/4
1008-A	2.00	2.50	1 5/16		7/8			11	11/16	1 3/4
1009	3.05	3.80	1 7/16	7/8			1	13 1/4	3/4	2
1709	3.05	3.80	1 1/2		1	1 1/4		13 1/4	3/4	2
1010	4.30	5.30	1 5/8	1		1 3/8	1 1/8	15	13/16	4
1010-A	4.30	5.30	1 11/16		1 1/8			15	13/16	4
1011	5.65	6.90	1 13/16	1 1/8			1 1/4	17	7/8	5
1011-A	5.65	6.90	1 7/8		1 1/4			17	7/8	5
1012	7.90	9.40	2	1 1/4			1 3/8	19	15/16	7
1012-A	7.90	9.40	2 1/16		1 3/8			19	15/16	7
1013	10.35	12.15	2 3/16	1 3/8			1 1/2	21	1 1/16	9
1013-A	10.35	12.15	2 1/4		1 1/2			21	1 1/16	9
1014	13.00	15.30	2 3/8	1 1/2				23	1 1/8	11
1014-A	13.00	15.30	2 7/16		1 5/8			23	1 1/8	11

ENGINEERS' WRENCHES

15° Angle, Double Head
Chrome Vanadium Steel



FINISHED—Chrome over Nickel, with heads buffed bright.
UNFINISHED—Gray enameled all over; heads not bright.
Will not spread or break.
Packed in cardboard boxes; Nos. 1020 to 1027, twelve in a box; Nos. 1728 to 1037-A, six in a box.

No.	Price Each		Nominal Openings Milled	For U. S. Std. Nuts: Size Bolts	For Amer. Std. Nuts (Reg.) and Finished Bolts	For Hex. Head Cap Screws; Dia. Screws	For S. A. E. Std. Nuts and Cap Screws Size Bolts	Extreme Lgth., App.	App. Thickness Heads	App. Wgt. Each, Ozs.
	Unfinished	Finished								
1020	$0.37	$0.53	1/4 & 5/16	1/8		1/8		3	5/32	1 1/2
1721	.40	.58	5/16 & 3/8	1/8		1/8 & 3/16		5 1/2	13/64	2
1021	.40	.58	5/16 & 13/32	1/8 & 3/16		1/8		5 1/2	13/64	2
1722	.40	.58	5/16 & 7/16	1/8	1/4	1/8 & 1/4	1/4	5 1/2	13/64	2
1723	.40	.58	3/8 & 7/16		1/4	3/16 & 1/4	1/4	5 1/2	13/64	2
1022	.50	.69	5/16 & 1/2	1/8 & 1/4		1/8 & 5/16	5/16	6	7/32	2
1023	.50	.69	13/32 & 1/2	3/16 & 1/4		5/16	5/16	6	7/32	2
1723-A	.50	.69	3/8 & 1/2	1/4		3/16 & 5/16	5/16	6	7/32	2
1024	.61	.82	13/32 & 19/32	3/16 & 5/16				6 1/2	1/4	3
1725	.61	.82	7/16 & 1/2	1/4	1/4	1/4 & 5/16	1/4 & 5/16	6 1/2	1/4	3
1725-A	.61	.82	7/16 & 9/16		1/4 & 5/16	1/4 & 3/8	1/4 & 3/8	6 1/2	1/4	3
1025-A	.61	.82	7/16 & 5/8		1/4 & 3/8	1/4 & 7/16	1/4 & 7/16	6 1/2	1/4	3
1725-B	.61	.82	1/2 & 9/16	1/4	5/16	5/16 & 3/8	5/16 & 3/8	6 1/2	1/4	3
1025	.61	.82	1/2 & 19/32	1/4 & 5/16		5/16	5/16	6 1/2	1/4	3
1726	.74	1.00	1/2 & 5/8	1/4	3/8	5/16 & 7/16	5/16 & 7/16	7	9/32	4
1026	.74	1.00	1/2 & 11/16	1/4 & 3/8		5/16	5/16	7	9/32	4
1727	.74	1.00	9/16 & 5/8		5/16 & 3/8	3/8 & 7/16	3/8 & 7/16	7	9/32	4
1027	.74	1.00	11/32 & 11/16	5/16 & 3/8				7	9/32	4
1027-C	.74	1.00	9/16 & 11/16	3/8	5/16	3/8	3/8	7	9/32	4
1728	.94	1.24	9/16 & 3/4		5/16 & 7/16	3/8 & 1/2	3/8 & 1/2	8	5/16	6
1028	.94	1.24	19/32 & 25/32	5/16 & 7/16				8	5/16	6
1028-S	.94	1.24	5/8 & 25/32	7/16	3/8	7/16	7/16	8	5/16	6
1729	.94	1.24	5/8 & 3/4		3/8 & 7/16	7/16 & 1/2	7/16 & 1/2	8	5/16	6
1029	.94	1.24	11/16 & 25/32	3/8 & 7/16				8	5/16	6
1730	94	1.24	5/8 & 13/16		3/8 & 1/2	7/16 & 9/16	7/16	8	5/16	6

Continued on page 148.

ENGINEERS' WRENCHES

15° Angle, Double Head
Chrome Vanadium Steel

(Continued)

These wrenches are drop forged from a special Chrome Vanadium Steel, heat treated. The deep-set jaws are thin and narrow—handy to get at the nut in close quarters. Will not spread or break.

For Whitworth Wrenches, see pages 142.

No.	Price Each		Nominal Openings Milled	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts (Reg.) and Finished Bolts	For Hex. Head Cap Screws Dia-Screw	For S. A. E. Screws Nuts and Cap Size Bolts	Extreme Lgth., App.	App. Thickness Heads	App. Wgt. Each, Ozs.
	Unfinished	Finished								
1030	$0.94	$1.24	11/16 & 7/8	3/8 & 1/2	9/16	5/8	9/16	8	5/16	6
1731	1.25	1.65	3/4 & 13/16	7/16 & 1/2	1/2 & 9/16	1/2 & 9/16	1/2	9 1/2	3/8	12
1731-A	1.25	1.65	3/4 & 7/8	1/2	7/16 & 9/16	1/2 & 5/8	1/2 & 9/16	9 1/2	3/8	12
1031	1.25	1.65	25/32 & 7/8	7/16 & 1/2	9/16	5/8	9/16	9 1/2	3/8	12
1731-B	1.25	1.65	13/16 & 7/8	1/2	1/2 & 9/16	9/16 & 5/8	9/16	9 1/2	3/8	12
1732-A	1.25	1.65	3/4 & 1		7/16 & 5/8	1/2 & 3/4	1/2	9 1/2	3/8	12
1032	1.25	1.65	29/32 & 31/32	7/16 & 9/16				9 1/2	3/8	12
1732	1.25	1.65	13/16 & 1		1/2 & 5/8	9/16 & 3/4	11/16	9 1/2	3/8	12
1033-A	1.25	1.65	7/8 & 15/16	1/2	9/16	5/8	9/16 & 5/8	9 1/2	3/8	12
1033	1.25	1.65	7/8 & 31/32	1/2 & 9/16	9/16	5/8	9/16	9 1/2	3/8	12
1733	1.70	2.25	7/8 & 1	1/2	9/16 & 5/8	5/8 & 3/4	9/16 & 11/16	10 3/4	7/16	16
1033-C	1.70	2.25	15/16 & 1		5/8	3/4	5/8 & 11/16	10 3/4	7/16	16
1034	1.70	2.25	7/8 & 1 1/16	1/2 & 5/8	9/16	5/8	9/16 & 3/4	10 3/4	7/16	16
1034-A	1.70	2.25	15/16 & 1 1/16	5/8			5/8 & 3/4	10 3/4	7/16	16
1734	1.70	2.25	7/8 & 1 1/8	1/2	9/16 & 3/4	5/8 & 7/8	9/16	10 3/4	7/16	16
1035	1.70	2.25	31/32 & 1 1/16	9/16 & 5/8			3/4	10 3/4	7/16	16
1735	2.45	3.15	1 & 1 1/8	5/8 & 3/4	3/4 & 7/8	1	11/16	12 1/4	1/2	27
1036	2.45	3.15	31/32 & 1 1/4	9/16 & 3/4			7/8	12 1/4	1/2	27
1736	2.45	3.15	1 & 1 1/4	3/4	5/8	3/4 & 1	11/16 & 7/8	12 1/4	1/2	27
1736-A	2.45	3.15	1 & 15/16	5/8 & 7/8	3/4	1	11/16	12 1/4	1/2	27
1037	2.45	3.15	1 1/16 & 1 1/4	5/8 & 3/4			3/4 & 7/8	12 1/4	1/2	27
1737	2.45	3.15	1 1/8 & 1 1/4	3/4	3/4	7/8 & 1	7/8	12 1/4	1/2	27
1037-A	2.45	3.15	1 1/8 & 15/16	3/4 & 7/8	7/8			12 1/4	1/2	27
1038	3.85	4.90	1 1/16 & 1 7/16	5/8 & 7/8			3/4 & 1	14	9/16	44
1738	3.85	4.90	1 1/8 & 1 3/8	3/4		7/8 & 1 1/8		14	9/16	44
1739	3.85	4.90	1 1/4 & 1 3/8	3/4		1 & 1 1/8	7/8	14	9/16	44
1039	3.85	4.90	1 1/4 & 1 7/16	3/4 & 7/8		1	7/8 & 1	14	9/16	44
1739-A	3.85	4.90	1 1/4 & 1 1/2	3/4	1	1 & 1 1/4	7/8	14	9/16	44
1739-C	3.85	4.90	1 5/16 & 1 1/4	7/8 & 1		1 1/4		14	9/16	44
1739-B	3.85	4.90	1 3/8 & 1 1/2		1	1 1/8 & 1 1/4		14	9/16	44
1040	3.85	4.90	1 1/4 & 1 5/8	3/4 & 1		1 & 1 3/8	7/8 & 1 1/8	14	9/16	44
1041	6.95	8.80	1 7/16 & 1 5/8	7/8 & 1		1 3/8	1 & 1 1/8	15 1/2	13/16	60

ENGINEERS' WRENCH SET No. 1025

Chrome Vanadium Steel

Six Armstrong Vanadium Wrenches in a strong, attractive case. These wrenches are drop-forged from a special Chrome-Vanadium Steel, heat treated and finished in Chrome over Nickel, with heads buffed bright. The deep set jaws are thin and narrow—handy to to get at the nut in close quarters.

Armstrong Vanadium Wrenches will not spread or break.

An especially serviceable set combining openings 3/8 to 1 inch by sixteenths. This set is especially recommended for garage and automobile work.

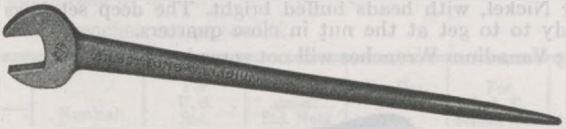
No.	Price, Each, Finished	Nominal Openings	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts (Reg.) and Fin'd Bolts	For Hex. Head Cap Screws, Dia. Screws	For S. A. E. Std. Nuts and Cap Screws; Size Bolts	Extreme Lgth., Approx.	Approx. Thickness Heads
1723	$0.58	3/8 & 7/16		1/4	3/16 & 1/4	1/4	5 1/2	13/64
1025	.82	1/2 & 19/32	1/4 & 5/16		5/16	5/16	6 1/2	1/4
1027-C	1.00	9/16 & 11/16	3/8	5/16	3/8	3/8	7	9/32
1028-S	1.24	5/8 & 23/32	7/16	3/8	7/16	7/16	8	5/16
1731-A	1.65	3/4 & 7/8	1/2	7/16 & 9/16	1/2 & 5/8	1/2 & 9/16	9 1/2	3/8
1033-C	2.25	1 1/16 & 1		5/8	3/4	5/8 & 11/16	10 3/4	7/16

Price, Complete Set (in cardboard box, Weight of Set 3 1/4 lbs. $7.54
Six Wrenches.... (in roll 8.65

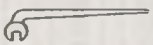
CONSTRUCTION WRENCHES

15° Angle
Chrome Vanadium Steel

The jaws are deep and narrow for a secure bearing on the nut while the handles of these wrenches are extra long and tapered for ease in lining up bolt holes.



Drop forged from Chrome Vanadium Steel, heat treated. Finished in cadmium-plate. Will not spread or break.



Wrenches with handles offset at 45° or 90° angle with opening as illustrated at left, can be furnished at special prices.

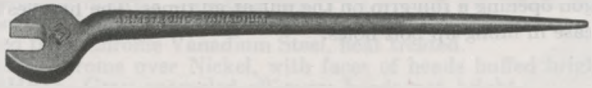
New No.	Old No.	Price Each Finished	Nominal Opening Milled	For U. S. Std. Nut Size Bolt	For Amer. Std. Reg. Nut Size Bolt	Extreme Length, Approx.	Approx. Thickness Head	Approx. Weight Each, Pounds
1201-A	1221-A	$1.10	7/16		1/4	8	3/8	1/2
1201	1221	1.10	1/2	1/4		8	3/8	1/2
1201-B	1221-B	1.10	9/16		5/16	8	3/8	1/2
1202	1222	1.10	19/32	5/16		8	3/8	1/2
1203-A	1223-A	1.43	5/8		3/8	12	7/16	1/2
1203	1223	1.43	11/16	3/8		12	7/16	1/2
1204-A	1224-A	1.43	3/4		7/16	12	7/16	1/2
1204	1224	1.43	25/32	7/16		12	7/16	1/2
1205-A	1225-A	1.86	13/16		1/2	14 1/2	17/32	1
1205	1225	1.86	7/8	1/2	9/16	14 1/2	17/32	1
1206	1226	1.86	31/32	9/16		14 1/2	17/32	1
1206-B	1226-B	1.86	1		5/8	14 1/2	17/32	1
1207	1227	2.60	1 1/16	5/8		17	5/8	1 3/4
1207-A	1227-A	2.60	1 1/8		3/4	17	5/8	1 3/4
1208	1228	3.50	1 1/4	3/4		19	11/16	2 7/8
1208-A	1228-A	3.50	1 5/16		7/8	19	11/16	2 7/8
1209	1229	4.80	1 7/16	7/8		21	3/4	3 1/2
1209-A	1229-A	4.80	1 1/2		1	21	3/4	3 1/2
1210	1230	6.80	1 5/8	1		23	27/32	5 1/8
1210-A	1230-A	6.80	1 11/16		1 1/8	23	27/32	5 1/8
1211	1231	10.00	1 13/16	1 1/8		21	1	7 1/2
1211-A	1231-A	10.00	1 7/8		1 1/4	21	1	7 1/2
1212	1232	10.00	2	1 1/4		21	1	7 1/2

STRUCTURAL WRENCHES

Straight Opening

Chrome Vanadium Steel

The deep and narrow jaws of these wrenches provide for a secure bearing on the nut. The offset head allows the wrench handle to clear obstructions and enables the user to keep the wrench squarely on the nut at all times. The handles are long and tapered for ease in lining up bolt holes.



Drop forged from Chrome Vanadium Steel, heat treated. Finished in Cadmium plate. Will not spread or break.

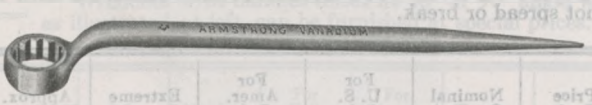
No.	Price Each Finished	Nominal Opening	For U. S. Std. Nut; Size Bolt	For Amer. Std. Reg. Nut; Size Bolt	Extreme Length, Approx.	Approx. Thickness Head	Approx. Weight Each, Pounds
1901-A	$1.26	7/16		1/4	9 1/2	3/8	1/4
1901	1.26	1/2	1/4		9 1/2	3/8	1/4
1901-B	1.26	9/16		5/16	9 1/2	3/8	1/4
1902	1.26	19/32	5/16		9 1/2	3/8	1/4
1903-A	1.68	5/8		3/8	12 1/4	15/32	3/4
1903	1.68	11/16	3/8		12 1/4	15/32	3/4
1904-A	1.68	3/4		7/16	12 1/4	15/32	3/4
1904	1.68	25/32	7/16		12 1/4	15/32	3/4
1905-A	2.25	13/16		1/2	14 1/2	17/32	1 1/4
1905	2.25	7/8	1/2	9/16	14 1/2	17/32	1 1/4
1906	2.25	31/32	9/16		14 1/2	17/32	1 1/4
1906-B	2.25	1		5/8	14 1/2	17/32	1 1/4
1907	3.15	1 1/16	5/8		17	5/8	2
1907-A	3.15	1 1/8		3/4	17	5/8	2
1908	4.25	1 1/4	3/4		19	11/16	3 1/4
1908-A	4.25	1 5/16		7/8	19	11/16	3 1/4
1909	5.85	1 7/16	7/8		21	3/4	4 1/4
1909-A	5.85	1 1/2		1	21	3/4	4 1/4
1910	8.10	1 5/8	1		23	7/8	5 7/8
1910-A	8.10	1 11/16		1 1/8	23	7/8	5 7/8
1911	12.25	1 13/16	1 1/8		21	1	7 1/2
1911-A	12.25	1 7/8		1 1/4	21	1	7 1/2
1912	12.25	2	1 1/4		21	1	7 1/2

STRUCTURAL BOX WRENCHES

Double Hexagon Opening
Chrome Vanadium Steel

These Structural Box Wrenches have definite safety features that recommend their use wherever an open end structural wrench is not required.

They are forged with maximum clearance at the offset, allowing the extra deep, double-hexagon opening a full grip on the nut at all times. The handles are long and tapered for ease in lining up bolt holes.



Drop forged from Chrome Vanadium Steel, heat treated. Finished in Cadmium plate. Will not spread or break.

No.	Price, Each Finished	Nominal Opening	For U. S. Std. Nut; Size Bolt	Extreme Length Aprox.	Approx. Weight Each, Pounds
9070	$3.10	1 1/16	5/8	15 1/4	1 1/2
9080	3.30	1 1/4	3/4	17	2
9090	4.40	1 3/16	7/8	20 1/2	3
9100	5.15	1 5/8	1	21 3/4	3 1/2
9110	5.50	1 13/16	1 1/8	23	4
9120	5.85	2	1 1/4	24 1/4	5
9130	7.65	2 3/16	1 3/8	25 3/4	6 1/2
9140	8.65	2 3/8	1 1/2	27 1/4	7
9150	9.60	2 9/16	1 5/8	29 1/4	9

DOUBLE HEXAGON BOX WRENCHES

7½° Angle, Single Head
Chrome Vanadium Steel

The Armstrong Vanadium Double Hexagon Box Wrench is particularly well adapted for working in extra close quarters. This wrench will rotate the nut when limited to a swing of only 15°.

Drop forged from Chrome Vanadium Steel, heat treated.

FINISHED—Chrome over Nickel, with faces of heads buffed bright.

UNFINISHED—Gray enameled all over; heads not bright.

Packed in cardboard boxes; Nos. 1801-A to 1804, twelve in a box; Nos. 1805-A to 1809-A, six in a box.

No.	Price Each		Nominal Opening	For U. S. Std. Nut; Size Bolt	For Amer. Std. Nut (Reg.) and Fin. Bolt	Extreme Length Approx.	Outside Diameter of Head Approx.	Approx. Weight Each, Pounds
	Unfinished	Finished						
1801-A	$0.55	$0.75	7/16		1/4	4	29/32	1/10
1801	.55	.75	1/2	1/4		4	29/32	1/10
1802-A	.65	.85	9/16		5/16	4 3/4	1 3/32	1/6
1802	.65	.85	19/32	5/16		4 3/4	1 3/32	1/6
1803-A	.70	1.00	5/8		3/8	5 1/2	1 1/4	1/4
1803	.70	1.00	11/16	3/8		5 1/2	1 1/4	1/4
1804-A	.90	1.15	3/4		7/16	6 1/2	1 3/8	1/3
1804	.90	1.15	25/32	7/16		6 1/2	1 3/8	1/3
1805-A	1.10	1.35	13/16		1/2	7 1/4	1 1/2	1/2
1805	1.10	1.35	7/8	1/2	9/16	7 1/4	1 1/2	1/2
1806	1.35	1.70	31/32	9/16		8	1 5/8	1/2
1806-B	1.35	1.70	1		5/8	8	1 5/8	1/2
1807	1.70	2.05	1 1/16	5/8		9 1/2	1 3/4	1/2
1807-A	1.70	2.05	1 1/8		3/4	9 1/2	1 3/4	1/2
1808	2.15	2.60	1 1/4	3/4		10 3/4	2 1/16	1 1/3
1808-A	2.15	2.60	1 5/16		7/8	10 3/4	2 1/16	1 1/3
1809	2.90	3.50	1 7/16	7/8		12	2 3/8	1 3/4
1809-A	2.90	3.50	1 1/2		1	12	2 3/8	1 3/4
1810	3.95	4.75	1 5/8	1		13 1/2	2 5/8	2 1/2
1810-A	3.95	4.75	1 11/16		1 1/8	13 1/2	2 5/8	2 1/2
1811	5.25	6.20	1 13/16	1 1/8		15	2 7/8	3
1811-A	5.25	6.20	1 7/8		1 1/4	15	2 7/8	3
1812	6.95	8.15	2	1 1/4		16 1/2	3 1/4	4
1812-A	6.95	8.15	2 1/16		1 3/8	16 1/2	3 1/4	4
1813	8.80	10.15	2 3/16	1 3/8		18	3 1/2	5
1813-A	8.80	10.15	2 1/4		1 1/2	18	3 1/2	5
1814	10.95	12.55	2 3/8	1 1/2		20	3 3/4	7

MINIATURE WRENCHES

15° Angle, Double Head

Chrome Vanadium Steel

Armstrong Vanadium Miniature Wrenches are invaluable for accurate work on generators, radios, refrigeration units—in fact any device requiring delicate adjustment is best serviced with these wrenches.

Set No. 20

These exceptionally small wrenches are drop forged from Chrome Vanadium Steel, heat treated. Finished in Chrome over Nickel with heads buffed bright. Will not spread or break.

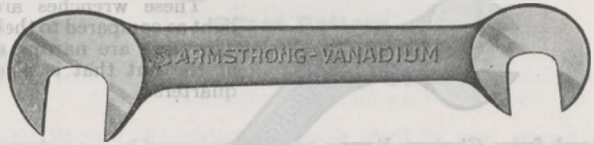
Armstrong Vanadium Miniature Wrenches are furnished singly or in Set No. 20 which contains 1 each of the wrenches listed below.

No.	Price, Each Finished	Nominal Openings	Extreme Length Approx.	Approx. Thickness Heads	Approx. Weight Each, Ounces
H-10	$0.53	3/16 & 7/32	2 1/2	3/32	1/8
H-12	.53	1/4 & 9/32	3	5/32	1/2
H-14	.57	5/16 & 11/32	3 3/4	3/16	1
H-16	.57	3/8 & 7/16	4 1/8	7/32	1 1/2
H-18	.57	13/32 & 15/32	4 1/8	7/32	1 1/2

Price, Set No. 20, Five Wrenches, complete..... (In Cardboard Box..... $2.77
Weight of Set, 8 oz. (In Roll..... 3.30

OBSTRUCTION WRENCHES

85° Angle, Double Head Chrome Vanadium Steel

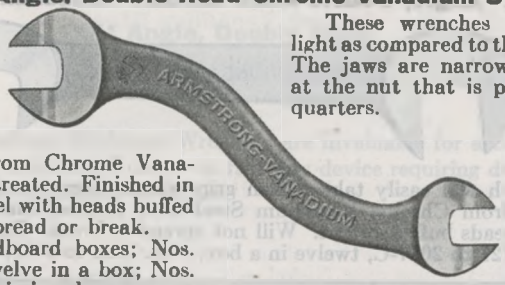


This wrench will easily take a firm grip where other wrenches cannot reach. Drop forged from Chrome Vanadium Steel heat treated; finished Chrome over Nickel, with heads buffed bright. Will not spread or break. Packed in cardboard boxes; Nos. 2721 to 2027-C, twelve in a box; Nos. 2728 to 2733, six in a box.

No.	Price Each Finished	Nominal Openings	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts (Reg.) & Finished Bolts	For Hex. Head Cap Screws; Dia. Screws	For S. A. E. Std. Nuts and Cap Screws Size Bolts	Extreme Lgth., App.	App. Th'kness H'ds.	App. Wgt. Each Ozs.
2721	$0.58	5/16 & 3/8	1/8		1/8 & 3/16		4 1/4	13/64	2
2021	.58	5/16 & 13/32	1/8 & 3/16		1/8		4 1/4	13/64	2
2722	.58	5/16 & 7/16	1/8	1/4	1/8 & 1/4	1/4	4 1/4	13/64	2
2723	.58	3/8 & 7/16		1/4	3/16 & 1/4	1/4	4 1/4	13/64	2
2023	.69	13/32 & 1/2	3/16 & 1/4		5/16	5/16	4 3/4	7/32	2 1/2
2723-A	.69	3/8 & 1/2	1/4		3/16 & 5/16	5/16	4 3/4	7/32	2 1/2
2725	.82	7/16 & 1/2	1/4	1/4	1/4 & 5/16	1/4 & 5/16	5 1/2	15/64	3 1/2
2725-A	.82	7/16 & 9/16		1/4 & 5/16	1/4 & 3/8	1/4 & 3/8	5 1/2	15/64	3 1/2
2025-A	.82	7/16 & 5/8		1/4 & 3/8	1/4 & 7/16	1/4 & 7/16	5 1/2	15/64	3 1/2
2725-B	.82	1/2 & 9/16	1/4	5/16	5/16 & 3/8	5/16 & 3/8	5 1/2	15/64	3 1/2
2025	.82	1/2 & 19/32	1/4 & 5/16		5/16	5/16	5 1/2	15/64	3 1/2
2726	1.00	1/2 & 5/8	1/4	3/8	5/16 & 7/16	5/16 & 7/16	6 1/2	9/32	4 1/2
2727	1.00	9/16 & 5/8		5/16 & 3/8	3/8 & 7/16	3/8 & 7/16	6 1/2	9/32	4 1/2
2027	1.00	19/32 & 11/16	5/16 & 3/8				6 1/2	9/32	4 1/2
2027-C	1.00	9/16 & 11/16	3/8	5/16	3/8	3/8	6 1/2	9/32	4 1/2
2728	1.24	9/16 & 3/4		5/16 & 7/16	3/8 & 1/2	3/8 & 1/2	7 3/4	5/16	6 1/2
2028	1.24	19/32 & 25/32	5/16 & 7/16				7 3/4	5/16	6 1/2
2028-S	1.24	5/8 & 25/32	7/16	3/8	7/16	7/16	7 3/4	5/16	6 1/2
2729	1.24	5/8 & 3/4		3/8 & 7/16	7/16 & 1/2	7/16 & 1/2	7 3/4	5/16	6 1/2
2730	1.24	5/8 & 13/16		3/8 & 1/2	7/16 & 9/16	7/16	7 3/4	5/16	6 1/2
2029	1.24	11/16 & 25/32	3/8 & 7/16				7 3/4	5/16	6 1/2
2030	1.24	11/16 & 7/8	3/8 & 1/2	9/16	5/8	9/16	7 3/4	5/16	6 1/2
2731	1.65	3/4 & 13/16		7/16 & 1/2	1/2 & 9/16	1/2	9 1/4	3/8	12
2731-A	1.65	3/4 & 7/8	1/2	7/16 & 9/16	1/2 & 5/8	1/2 & 9/16	9 1/4	3/8	12
2031	1.65	25/32 & 7/8	7/16 & 1/2	9/16	5/8	9/16	9 1/4	3/8	12
2732	1.65	13/16 & 1		1/2 & 5/8	9/16 & 3/4	11/16	9 1/4	3/8	12
2033-A	1.65	7/8 & 15/16	1/2	9/16	5/8	9/16 & 5/8	9 1/4	3/8	12
2033	1.65	7/8 & 31/32	1/2 & 9/16	9/16	5/8	9/16	9 1/4	3/8	12
2733	1.65	7/8 & 1	1/2	9/16 & 5/8	5/8 & 3/4	9/16 & 11/16	9 1/4	3/8	12

"S" WRENCHES

22½° Angle, Double Head Chrome Vanadium Steel



These wrenches are long and light as compared to their capacities. The jaws are narrow and can get at the nut that is placed in close quarters.

Drop forged from Chrome Vanadium Steel, heat treated. Finished in Chrome over Nickel with heads buffed bright. Will not spread or break.

Packed in cardboard boxes; Nos. 1075-B to 1075, twelve in a box; Nos. 1077-S to 1085-K, six in a box.

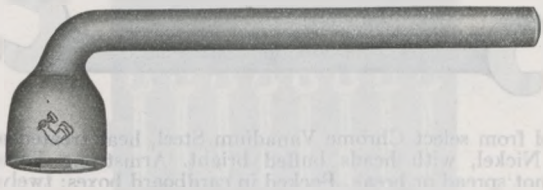
No.	Price Each Finished	Nominal Openings	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts (Reg.) & Finished Bolts	For Hex. Head Cap Screws; Dia. Screws	For S. A. E. Std. Nuts and Cap Screws Size Bolts	Extreme Lgth., App.	App. Thickness H'ds.	App. Wgt. Each Ozs.
1075-B	$0.93	3/8 & 7/16		1/4	3/16 & 1/4	1/4	6 1/4	1/4	2
1075-A	.93	3/8 & 1/2	1/4		3/16 & 5/16	5/16	6 1/4	1/4	2
1075	.93	15/32 & 1/2	3/16 & 1/4		5/16	5/16	6 1/4	1/4	2
1077-S	1.18	7/16 & 1/2	1/4	1/4	1/4 & 5/16	1/4 & 5/16	7 1/4	9/32	4
1077-C	1.18	7/16 & 9/16		1/4 & 5/16	1/4 & 3/8	1/4 & 3/8	7 1/4	9/32	4
1077-E	1.18	7/16 & 5/8		1/4 & 3/8	1/4 & 7/16	1/4 & 7/16	7 1/4	9/32	4
1077-B	1.18	1/2 & 9/16	1/4	5/16	5/16 & 3/8	5/16 & 3/8	7 1/4	9/32	4
1077	1.18	1/2 & 5/8	1/4	3/8	5/16 & 7/16	5/16 & 7/16	7 1/4	9/32	4
1079-B	1.45	9/16 & 13/32	5/16	5/16	3/8	3/8	8 1/4	5/16	6
1079-S	1.45	9/16 & 5/8		5/16 & 3/8	3/8 & 7/16	3/8 & 7/16	8 1/4	5/16	6
1079-A	1.45	9/16 & 11/16	3/8	5/16	3/8	3/8	8 1/4	5/16	6
1079-E	1.45	9/16 & 3/4		5/16 & 7/16	3/8 & 1/2	3/8 & 1/2	8 1/4	5/16	6
1079	1.45	5/8 & 11/16	3/8	3/8	7/16	7/16	8 1/4	5/16	6
1079-C	1.45	5/8 & 3/4		3/8 & 7/16	7/16 & 1/2	7/16 & 1/2	8 1/4	5/16	6
1081-H	1.75	5/8 & 13/16		3/8 & 1/2	7/16 & 9/16	7/16	9 1/4	3/8	12
1081	1.75	11/16 & 27/32	3/8				9 1/4	3/8	12
1081-B	1.75	3/4 & 13/16		7/16 & 1/2	1/2 & 9/16	1/2	9 1/4	3/8	12
1081-A	1.75	3/4 & 7/8	1/2	7/16 & 9/16	1/2 & 5/8	1/2 & 9/16	9 1/4	3/8	12
1083-K	2.30	13/16 & 7/8		1/2 & 9/16	9/16 & 5/8	9/16	10 3/8	7/16	16
1083-J	2.30	13/16 & 1		1/2 & 5/8	9/16 & 3/4	11/16	10 3/8	7/16	16
1083	2.30	27/32 & 15/16				5/8	10 3/8	7/16	16
1083-B	2.30	7/8 & 1	1/2	9/16 & 5/8	5/8 & 3/4	9/16 & 11/16	10 3/8	7/16	16
1083-A	2.30	15/16 & 1		5/8	3/4	5/8 & 11/16	10 3/8	7/16	16
1085-H	3.30	7/8 & 1 1/8		9/16 & 3/4	5/8 & 7/8	9/16	12	1/2	28
1085	3.30	1 & 1 1/8		5/8 & 3/4	3/4 & 7/8	11/16	12	1/2	28
1085-J	3.30	1 & 1 5/16		5/8 & 7/8	3/4	11/16	12	1/2	28
1085-C	3.30	1 1/16 & 1 1/4	5/8 & 3/4		1	3/4 & 7/8	12	1/2	28
1085-B	3.30	1 1/8 & 1 1/4	3/4	3/4	7/8 & 1	7/8	12	1/2	28
1085-K	3.30	1 1/8 & 1 5/16		3/4 & 7/8	7/8		12	1/2	28

SOCKET WRENCHES

Offset Pattern

Chrome Vanadium Steel

These wrenches are of heavy design and are particularly well adapted for severe service, such as heavy die work, oil refinery cracking-units and other similar jobs requiring exceptionally strong and dependable wrenches.



Drop forged from Chrome Vanadium Steel, heat treated. Finished in Cadmium plate. Will not spread or break.

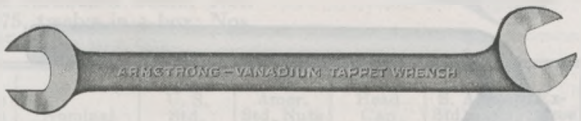
No.	Price Each Finished	Nominal Broached Opening	HEXAGON OPENINGS			Extreme Lgth. Approx.	Approx. Dia. Head	Approx. Wgt. Each, Lbs.
			For U. S. Std. Nut Size Bolt	For Cap Screw Dia. Screw	For S. A. E. Std Screw and Nut, Size Bolt			
2273	$ 5.10	1 1/16	5/8		3/4	11 5/8	1 3/4	2 1/2
2274	5.70	1 1/4	3/4	1	7/8	12 3/8	2	3
2276	6.90	1 1/16	7/8		1	14 7/8	2 1/4	4 1/2
2277	8.30	1 5/8	1	1 3/8	1 1/8	16 1/2	2 1/2	6
2278	9.80	1 13/16	1 1/8		1 1/4	18 1/4	2 3/4	8 1/8
2279	11.65	2	1 1/4		1 3/8	20	3	10
2280	14.80	2 3/16	1 3/8		1 1/2	21 3/4	3 3/8	13
2280-A	14.80	2 3/8	1 1/2			21 3/4	3 3/8	13

TAPPET WRENCHES

Chrome Vanadium Steel

These wrenches are the result of our many years' experience in making alloy steel tappet wrenches. Their extreme length allows the adjusting of tappets while the motor is hot, the proper time for tappet adjusting.

The long narrow jaws of these wrenches enables the user to get hold of the inaccessible tappet nut. Both openings are the same size but at different angles, one straight and the other at an angle of 22½ degrees. This allows for extra fine adjustment.



Drop forged from select Chrome Vanadium Steel, heat treated and finished in Chrome over Nickel, with heads buffed bright. Armstrong Vanadium Tappet Wrenches will not spread or break. Packed in cardboard boxes: twelve to a box.

A Stock and Display Board for these wrenches is available without charge. Write for details on Display Board No. 46.

No.	Price Each Finished	Nominal Milled Opening	For S. A. E. Standard Nuts, Bolt Size	For U. S. S. Nuts, Bolt Size	Extreme Length Approx.	Approx. Thickness of Head	Approx. Weight Each, Oz.
401	$1.57	3/8			8	5/32	2
401-A	1.57	7/16	1/4		8	5/32	2
402	1.57	1/2	5/16	1/4	8½	5/32	4
402-A	1.57	17/32			8½	5/32	4
403	1.57	9/16	3/8		8½	5/32	4
403-A	1.57	19/32		5/16	8½	5/32	4
404	1.70	5/8	7/16		8½	3/16	4
404-A	1.70	21/32			8½	3/16	4
405	1.70	11/16		3/8	8½	3/16	4
406	1.92	3/4	1/2		9	7/32	6
406-A	1.92	25/32		7/16	9	7/32	6
407	1.92	13/16			9	7/32	6
407-A	1.92	7/8	9/16	1/2	9	7/32	6
408	2.13	15/16	5/8		9	7/32	6
408-A	2.13	31/32		9/16	9	7/32	6
409	2.13	1	11/16		9	7/32	6

TAPPET WRENCH SET No. 412

Chrome Vanadium Steel

This set consists of two each of the most used tappet wrenches Nos. 402, 403, 404 and 405. Seventy per cent of all passenger car valve tappets can be adjusted with this set.

Drop forged from Chrome Vanadium Steel, heat treated. Finished in Chrome over Nickel with heads buffed bright. Armstrong Vanadium Wrenches will not spread or break.

No.	Price Each Finished	Nominal Milled Opening	S. A. E. Std. Nuts, Bolt Size	U. S. Std. Nuts, Bolt Size	Extreme Length Approx.	Approx. Thickness of Head
402	$1.57	1/2	5/16	1/4	8 1/2	5/32
402	1.57	1/2	5/16	1/4	8 1/2	5/32
403	1.57	9/16	3/8		8 1/2	5/32
403	1.57	9/16	3/8		8 1/2	5/32
404	1.70	5/8	7/16		8 1/2	3/16
404	1.70	5/8	7/16		8 1/2	3/16
405	1.70	11/16		3/8	8 1/2	3/16
405	1.70	11/16		5/8	8 1/2	3/16
Price, complete set, Eight Wrenches..		In cardboard box.....			$13.08	Wt. Set
		In Roll.....			13.98	2 1/2 lbs.

TAPPET WRENCHES

15° Angle

Chrome Vanadium Steel

This line of Armstrong Vanadium super-quality Tappet Wrenches is offered to those who prefer the 15° angle opening at both ends and different size openings at each end.

Long and thin, these Tappet Wrenches combine the qualities of lightness and handiness with great strength.

Drop forged from Chrome Vanadium Steel, heat treated. Finished in Chrome over Nickel with heads buffed bright. Armstrong Vanadium Tappet Wrenches will not spread or break.

Packed in cardboard boxes; twelve to a box.

A Stock and Display Board for these wrenches is available without charge. Write for details on Display Board No. 426.

No.	Price Each Finished	Nominal Openings Milled	For S. A. E. Standard Nuts Bolt Size	For U. S. S. Nuts Bolt Size	Extreme Length Approx.	Approx. Thickness of Head	Approx. Weight Each, Oz.
420	$0.76	7/16 & 17/32	1/4		8	5/32	2
422	.76	1/2 & 9/16	5/16 & 3/8	1/4	8	5/32	2
424	.82	5/8 & 11/16	7/16	3/8	8 1/2	3/16	4
425	.88	3/4 & 13/16	1/2		9	7/32	6
426	.88	3/4 & 7/8	1/2 & 9/16	1/2	9	7/32	6
428	1.06	15/16 & 1	5/8 & 11/16		9 1/2	7/32	8

TAPPET WRENCH SET No. 22

Chrome Vanadium Steel

This kit of 15° angle Armstrong Vanadium Tappet Wrenches contains 2 each of 3 sizes with combined openings from ½" to ⅞". This range of sizes permits the adjustment of tappets on most trucks and busses as well as passenger cars.

Drop forged from Chrome Vanadium Steel, heat treated. Finished in Chrome over Nickel with heads buffed bright.

Armstrong Vanadium Wrenches will not spread or break.

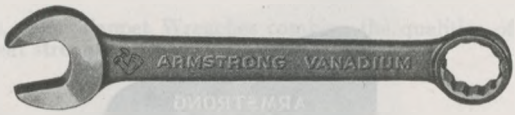
No.	Price Each Finished	Nominal Opening Milled	For S. A. E. Std. Nuts Bolt Size	For U. S. Std. Nuts Bolt Size	Extreme Length Approx.	Approx. Thickness of Head
422	$0.76	½ & 9/16	5/16 & 3/8	¼	8	5/32
424	.82	5/8 & 11/16	7/16	5/8	8½	3/16
426	.88	¾ & ⅞	½ & 9/16	½	9	7/32

Price, complete set, Six Wrenches..... {In Cardboard Box..... $4.92
Weight of Set, 1¼ lbs. {In Roll..... 5.45

MULTI-TYPE WRENCHES

Chrome Vanadium Steel

This handy wrench has a 15° angle milled at one end and a double hexagon or 12 point opening with 15° offset at the other end. Both ends have the same size opening. The advantages of both the open end and the box socket patterns are thus obtained in a single wrench. This feature makes the Multi-Type Wrench very useful for innumerable jobs.



Set No. 19

Drop forged from Chrome Vanadium Steel, heat treated. Finished in Chrome over Nickel with heads buffed bright. Will not spread or break.

These wrenches are furnished either singly or in Set No. 19, which contains one each of the wrenches Nos. 3114, 3116, 3118 and 3120 listed below.

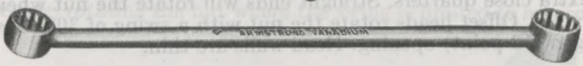
Price, Set No. 19, Four Wrenches, complete. Weight of Set, ¾ lb..... In Cardboard Box...$5.41 In Roll..... 6.00

No.	Price Each Finished	Nominal Openings	For U. S. Std. Nut; Size Bolt	For Amer. Std. Nut (Reg.) & Finished Bolt	For Hex. Head Cap Screw; Dia. Screw	For S. A. E. Std. Nut and Cap Screw, Size Bolt	Extreme Length, Approx.	Approx. Weight Each, Ozs.
3114	$1.18	7/16 & 7/16		1/4	1/4	1/4	5	1½
3116	1.28	½ & ½	1/4		5/16	5/16	5 3/8	2
3118	1.40	9/16 & 9/16		5/16	3/8	3/8	5 7/8	3
3120	1.55	5/8 & 5/8		3/8	7/16	7/16	6¼	4
3122	1.70	11/16 & 11/16	3/8				7	6
3124	1.85	¾ & ¾		7/16	½	½	8	8

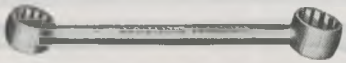
BOX SOCKET WRENCHES

15° Offset — Chrome Vanadium Steel

Long



Short



These Wrenches have straight handles with the heads offset at a 15° angle. This design provides greater clearance at the end of the handle yet retains the steady grip of a straight wrench. Each head has a double hexagon (12 point) opening.

Drop Forged from Chrome Vanadium Steel, heat treated. Finished in cadmium plate with heads buffed bright. Will not spread or break.

These Wrenches are furnished either singly or in Set No. 2400.

15° Offset — Long

No.	Price Each Finished	Nominal Openings	For U. S. Std. Nuts; Size Bolts	For Amer. Std. Nuts; (Reg.) and Finished Bolts	For Hex. Head Cap Screws, Diameter Screws	For S. A. E. Std. Nuts and Cap Screws	Extreme Length Approx.	Approx. Weight Each, Oz.
2414	$0.95	3/8 & 1/2	1/4		3/16 & 5/16	5/16	7 1/4	3
2415	.95	7/16 & 1/2	1/4	1/4	1/4 & 5/16	1/4 & 5/16	7 1/4	3
2418	1.05	9/16 & 5/8		5/16 & 3/8	3/8 & 7/16	3/8 & 7/16	9 1/4	5
2419	1.05	19/32 & 11/16	5/16 & 3/8				9 1/4	5
2425	1.20	5/8 & 3/4		3/8 & 7/16	7/16 & 1/2	7/16 & 1/2	11 1/4	10
2426	1.40	3/4 & 7/8	1/2	7/16 & 9/16	1/2 & 5/8	1/2 & 9/16	11 1/4	10
2427	1.40	25/32 & 13/16	7/16	1/2	9/16		11 1/4	10
2429	1.85	15/16 & 1		5/8	3/4	5/8 & 11/16	15 1/4	22
2431	1.85	7/8 & 1 1/16	1/2 & 5/8	9/16	5/8	9/16 & 3/4	15 1/4	22

15° Offset — Short

6723	.95	3/8 & 7/16		1/4	3/16 & 1/4	1/4	4 1/2	2
6725	1.00	7/16 & 1/2	1/4	1/4	1/4 & 5/16	1/4 & 5/16	5 1/2	3
6725	1.00	1/2 & 9/16	1/4	5/16	5/16 & 3/8	5/16 & 3/8	5 1/2	3
6727	1.10	5/16 & 5/8		5/16 & 3/8	3/8 & 7/16	3/8 & 7/16	6	4

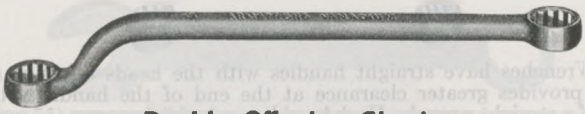
Set No. 2400—1 each Nos. 2415, 2418, 2426, long wrenches, as listed above—
3 Wrenches. Price complete, in roll $4.00
Weight of set, 20 ounces

BOX SOCKET WRENCHES

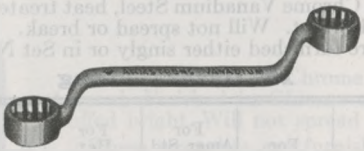
Chrome Vanadium Steel

The Armstrong Vanadium Box Socket Wrench is particularly well adapted for working in extra close quarters. Straight ends will rotate the nut when limited to a swing of only 15°. Offset heads rotate the nut with a swing of 30°. Each head has a double hexagon (12 point) opening. Head walls are thin.

Single Offset — Long



Double Offset — Short



Drop forged from Chrome Vanadium Steel, heat treated. Finished in cadmium plate with heads buffed bright. Will not spread or break.

For carefully selected Wrench Sets, see page 166.

SINGLE OFFSET—LONG

No.	Price Each Finished	Nominal Openings	For U. S. Std. Nut; Size Bolt	For Amer. Std. Nut (Reg.) & Finished Bolt	For Hex. Head Cap Screw; Dia. Screw	For S. A. E. Std. Nut and Cap Screw, Size Bolt	Extreme Length, Approx.	Approx. Weight Each, Ozs.
8128	1.30	7/16 & 7/16	1/4	1/4	1/4	1/4	8 3/16	3
8132	1.40	1/2 & 1/2			5/16	5/16	9 1/4	4
8136	1.45	9/16 & 9/16		5/16	3/8	3/8	9 1/2	5
8140	1.60	5/8 & 5/8		3/8	7/16	7/16	10 7/8	10
8148	1.75	3/4 & 3/4		7/16	1/2	1/2	12 1/2	15

DOUBLE OFFSET—SHORT

9723	.95	3/8 & 7/16			1/4	3/16 & 1/4		1/4	4 1/2	1 1/2
9725	1.00	7/16 & 1/2		1/4	1/4	1/4 & 5/16	1/4 & 5/16		5 1/2	3
9725-B	1.00	1/2 & 9/16	1/4		5/16	5/16 & 3/8	5/16 & 3/8		5 1/2	3
9727	1.10	9/16 & 5/8			5/16 & 3/8	3/8 & 7/16	3/8 & 7/16		6	4
9728-A	1.10	5/8 & 11/16		3/8	3/8	7/16	7/16		6	4
9729-A	1.25	11/16 & 3/4	3/8		7/16	1/2		1/2	7	6

BOX SOCKET WRENCHES

Double Offset—Long

The design of these wrenches provides unusual reach and leverage. Socket head walls are thin, allowing use in very close quarters. Each head has a double hexagon (12 point) opening, rotating the nut where the swing is limited to an arc of only 30°.

Drop forged from Chrome Vanadium Steel, heat treated. Finished in cadmium plate with heads buffed bright. Will not break or spread.

For Whitworth sizes, see page 142. For carefully selected Wrench Sets, see page 166.

DOUBLE OFFSET—LONG

No.	Price, Each, Finished	Nominal Openings	For U. S. Std. Nuts; Size Bolt	For Amer. Std. Nuts (Reg.) and Fin'd Bolt	For Hex. Head Cap Screws, Dia. Screw	For S. A. E. Std. Nuts and Cap Screws; Size Bolt	Extreme Lgth., Approx.	Approx Wgt. Each. Oz.
8021	$0.80	5/16 & 13/32	1/8 & 3/16		1/8		7 1/2	3
8723	.95	3/8 & 7/16		1/4	3/16 & 1/4	1/4	7 5/8	4
8023	.95	13/32 & 1/2	3/16 & 1/4		5/16	5/16	7 5/8	4
8725	.95	7/16 & 1/2	1/4	1/4	1/4 & 5/16	1/4 & 5/16	7 5/8	4
8725-B	1.00	1/2 & 9/16	1/4	5/16	5/16 & 3/8	5/16 & 3/8	9 3/8	6
8025	1.00	1/2 & 19/32	1/4 & 5/16		5/16	5/16	9 3/8	6
8727	1.05	9/16 & 5/8		5/16 & 3/8	3/8 & 7/16	3/8 & 7/16	9 3/8	6
8027	1.05	13/32 & 11/16	5/16 & 3/8				10 1/4	7
8028-A	1.20	5/8 & 11/16	3/8	3/8	7/16	7/16	10 1/4	7
8729	1.20	5/8 & 3/4		3/8 & 7/16	7/16 & 1/2	7/16 & 1/2	12	12
8029	1.35	11/16 & 25/32	3/8 & 7/16				12	12
8031-A	1.40	3/4 & 25/32	7/16	7/16	1/2	1/2	12	12
8731	1.40	3/4 & 13/16		7/16 & 1/2	1/2 & 9/16	1/2	12	12
8731-A	1.40	3/4 & 7/8	1/2	7/16 & 9/16	1/2 & 5/8	1/2 & 9/16	12	12
8731-B	1.60	13/16 & 7/8	1/2	1/2 & 9/16	9/16 & 5/8	9/16	14 3/8	18
8033-A	1.65	7/8 & 15/16	1/2	9/16	5/8	9/16 & 5/8	14 3/8	18
8033	1.65	7/8 & 31/32	1/2 & 9/16	9/16	5/8	9/16	14 3/8	18
8733	1.85	7/8 & 1	1/2	9/16 & 5/8	5/8 & 3/4	9/16 & 11/16	14 3/8	18
8034	1.85	7/8 & 1 1/16	1/2 & 5/8	9/16	5/8	9/16 & 3/4	14 3/8	18
8033-C	2.95	15/16 & 1		5/8	3/4	5/8 & 11/16	16 1/8	22
8034-A	2.95	15/16 & 1 1/16	5/8			5/8 & 3/4	16 1/8	22
8035-A	3.25	1 & 1 1/16	5/8	5/8	3/4	11/16 & 3/4	16 1/8	22
8735	3.25	1 & 1 1/8		5/8 & 3/4	3/4 & 7/8	11/16	16 1/8	22
8037	3.25	1 1/16 & 1 1/4	5/8 & 3/4		1	3/4 & 7/8	16 1/8	22
8037-A	3.30	1 1/8 & 1 5/16		3/4 & 7/8	7/8		16 1/8	22
8039	3.80	1 1/4 & 1 3/8	3/4 & 7/8		1	7/8 & 1	18 1/2	44

BOX SOCKET WRENCH SETS

Chrome Vanadium Steel

For complete description of the wrenches in these sets, see pages 164-165. Weight includes roll or steel case.

SET No. 9703—A pocket size kit of short, double offset box socket wrenches with different openings in each end.

Set contains one each Nos. 9723, 9725 and 9727 (openings 3/8 and 7/16, 7/16 and 1/2, 9/16 and 5/8).

Price, complete set, Three Wrenches..... {In Leatherette Roll..... $3.60
Approx. Weight of Set 10 oz. {In Cardboard Box..... 3.05

SET No. 8005-A—Contains five double offset, long box socket wrenches, one each Nos. 8023, 8025, 8029, 8033 and 8037 (openings 13/32 and 1/2, 1/2 and 19/32, 11/16 and 25/32, 7/8 and 31/32, 1 1/16 and 1 1/4).

Price, complete set, Five Wrenches..... {In Strong Metal Case.... $10.75
Approx. Weight of Set 5 3/4 lbs. {In Cardboard Box..... 8.20

SET No. 8097—Combination Set—Takes in openings 3/8 to 15/16 by sixteenths. Contains one each Nos. 9723, 9725-B, 9727, 8725-B, 8028-A, 8731 and 8033-A.

Price, complete set, Seven Wrenches..... {In Strong Metal Case.... $10.95
Approx. Weight of Set 5 lbs. {In Cardboard Box..... 8.30

SET No. 8105—Five single offset double hexagon wrenches with same openings at each end. Contains one each Nos. 8128, 8132, 8136, 8140 and 8148 (openings 7/16, 1/2, 9/16, 5/8 and 3/4).

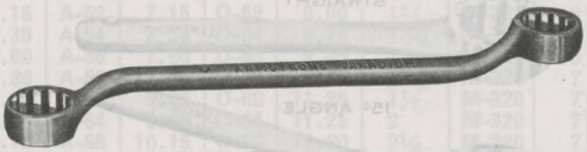
Price, complete set, Five Wrenches..... {In Strong Metal Case.... $10.05
Weight of Set 4 1/2 lbs. {In Cardboard Box..... 7.50

HEAVY DUTY BOX SOCKET WRENCHES

Chrome Vanadium Steel

These Heavy Duty Wrenches are recommended for the heaviest industrial and oil field work.

Designed with maximum clearance at the offset, the handles are forged with a deep fillet at the head for greatest strength with a minimum of weight. Each head has a double hexagon (12 point) opening, rotating the nut where the swing is limited to an arc of only 30°.



Drop forged from Chrome Vanadium Steel, heat treated. Finished in cadmium plate. Will not break or spread.

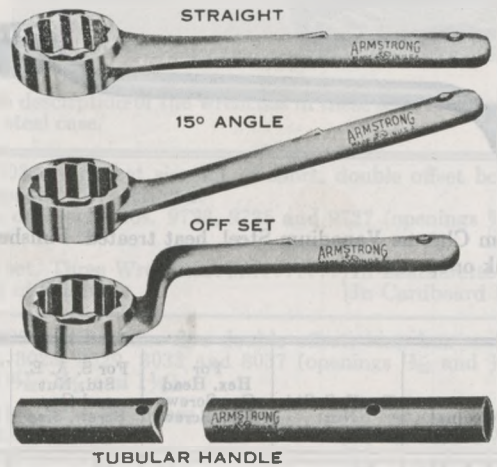
No.	Price Each Finished	Nominal Openings	For U. S. Std. Nut; Size Bolt	For Hex. Head Cap Screw; Dia. Screw	For S. A. E. Std. Nut and Cap Screw, Size Bolt	Extreme Length, Approx.	Approx. Weight Each, Lbs.
5035-A	$3.28	1 1/16 & 1 1/8	5/8	7/8	3/4	15 1/2	1 3/4
5037	3.28	1 1/16 & 1 1/4	5/8 & 3/4	1	3/4 & 7/8	16 1/2	2 1/4
5739	3.82	1 1/4 & 1 3/8	3/4	1 & 1 1/8	7/8	18 1/2	2 1/2
5039	4.75	1 1/4 & 1 7/16	3/4 & 7/8	1	7/8 & 1	23	3 3/4
5041	4.95	1 7/16 & 1 5/8	7/8 & 1	1 3/8	1 & 1 1/8	23	4
5045	8.45	1 13/16 & 2	1 1/8 & 1 1/4		1 1/4 & 1 3/8	24 1/2	6 1/2
5048	9.80	2 & 2 3/8	1 1/4 & 1 1/2		1 3/8	26	9
5049	10.60	2 3/16 & 2 3/8	1 3/8 & 1 1/2		1 1/2	26	8
5053	16.25	2 9/16 & 2 3/4	1 5/8 & 1 3/4			28	11 1/2

BOX SOCKET WRENCHES

Stub End Type for Tubular Handles

Chrome Vanadium Steel

These ruggedly designed long leverage Box Socket Wrenches are available in three styles: Straight, 15 degree Angle and Offset. All are equipped with an improved handle stop and a positive locking device by means of which one tubular handle may be used with various sizes and styles of wrenches. A single or double end wrench of the style and size required can be quickly assembled. Each head has a double hexagon (12 point) opening.



Drop forged from Chrome Vanadium Steel, heat treated. Finished in Chrome over Nickel with heads buffed bright. Will not spread or break.

Seamless Steel Tubular Handles are furnished for use with these wrenches. They are accurately made from special steel and are very stiff. Finished in Chrome over Nickel.

Continued on page 169.

BOX SOCKET WRENCHES

Stub End Type for Tubular Handles

Chrome Vanadium Steel
(Continued)

SPECIFICATIONS AND PRICES WRENCHES

STRAIGHT		15° ANGLE		OFFSET		Nominal Opening	For Handle No.	Approx. †Length End to Handle Stop	Approx. Weight, Lbs.
No.	Price* Each Finished	No.	Price* Each Finished	No.	Price* Each Finished				
S-40	$3.60	A-40	$3.60	O-40	$4.15	1¼	M-280	4⅝	1¼
S-42	4.70	A-42	4.70	O-42	5.20	1⅝	M-280	4¾	1¼
S-44	5.75	A-44	5.75	O-44	6.95	1⅞	M-280	5½	1½
S-46	5.75	A-46	5.75	O-46	6.95	1 7/16	M-280	5⅝	1½
S-48	6.25	A-48	6.25	O-48	7.50	1½	M-280	6	1¾
S-52	7.15	A-52	7.15	O-52	9.00	1⅝	M-320	6½	2¼
S-54	7.35	A-54	7.35	O-54	9.25	1 11/16	M-320	6½	2¼
S-56	7.60	A-56	7.60	O-56	9.45	1¾	M-320	6⅝	2¼
S-58	7.80	A-58	7.80	O-58	9.65	1 13/16	M-320	7	2½
S-60	9.35	A-60	9.65	O-60	11.25	1⅞	M-320	7½	2¾
S-64	9.35	A-64	9.65	O-64	11.25	2	M-320	7½	3
S-66	9.75	A-66	10.15	O-66	11.60	2 1/16	M-320	7½	3
S-70	10.10	A-70	10.60	O-70	12.05	2 3/16	M-320	7½	3
S-72	10.10	A-72	10.60	O-72	12.05	2¼	M-320	7½	3½
S-76	12.80	A-76	13.45	O-76	14.00	2⅜	M-360	8	5
S-78	13.05	A-78	13.75	O-78	15.10	2 7/16	M-360	8	4¾
S-82	13.30	A-82	14.00	O-82	15.30	2 9/16	M-360	8	4¾
S-84	13.55	A-84	14.85	O-84	16.10	2⅝	M-360	8	5¼
S-88	14.30	A-88	15.60	O-88	16.85	2¾	M-360	8	5¼
S-90	15.05	A-90	16.20	O-90	17.40	2 13/16	M-360	8	6
S-94	15.85	A-94	16.85	O-94	17.90	2 15/16	M-360	8	6
S-96	16.10	A-96	17.10	O-96	18.15	3	M-360	8	6
S-98	16.35	A-98	17.40	O-98	18.40	3⅛	M-360	8	6
S-108	16.60	A-108	17.65	O-108	18.70	3⅜	M-360	8	6
S-112	19.95	A-112	22.00	O-112	24.00	3½	M-420	10	8½

*Price does not include Handle.
†Length is for Offset Wrenches, straight and 15° are slightly longer.

SEAMLESS STEEL TUBULAR HANDLES

Handle No.	Price	Extreme Length	Inside Diameter	Outside Diameter	Approx. Weight, Lbs.
M-280	$4.80	24	⅞	1⅛	2½
M-320	6.60	30	1	1¼	3½
M-360	10.25	36	1⅛	1 7/16	6⅜
M-420	14.30	42	1⅜	1¾	11

WRENCH OPENINGS

Bolt Nut and Cap Screw Sizes

Armstrong Vanadium Sockets are marked with catalog number and nominal size of opening across flats. The table below will quickly identify each opening with the correct bolt, nut or cap screw size. When ordering, be sure to specify catalog numbers.

Hexagon Opening, Inches	For U. S. Std. Nut; Size Bolt, Inches	For American Std. Nuts		For Hex. Head Cap Screw; Diameter Screw, Inches	For S. A. E. Std. Nut and Cap Screw Size Bolt, Inches	Hexagon Opening, Inches
		Regular and Jam, Inches	Light and Castel, Inches			
5/32		No. 0 & 1*				5/32
3/16		2 & 3*				3/16
1/4		4*				1/4
5/16	1/8	5 & 6*		1/8		5/16
11/32		8*				11/32
3/8		10*		5/16		3/8
7/16		*12 & 1/4	1/4	1/4	1/4	7/16
1/2	1/4		5/16	5/16	5/16	1/2
9/16		5/16	3/8	3/8	3/8	9/16
19/32	5/16					19/32
5/8		3/8	7/16	7/16	7/16	5/8
11/16	3/8					11/16
3/4		7/16	1/2	1/2	1/2	3/4
25/32	7/16					25/32
13/16		1/2		9/16		13/16
7/8	1/2	9/16	9/16	5/8	9/16	7/8
15/16			5/8		5/8	15/16
31/32	9/16					31/32
1		5/8		3/4	11/16	1
1 1/16	5/8		3/4		3/4	1 1/16
1 1/8		3/4		7/8		1 1/8
1 1/4	3/4		7/8	1	7/8	1 1/4
1 5/16		7/8		(†1)		1 5/16
1 3/8				1 1/8		1 3/8
1 7/16	7/8		1		1	1 7/16
1 1/2		1		(†1 1/8) 1 1/4		1 1/2
1 5/8	1		1 1/8	1 3/8	1 1/8	1 5/8
1 11/16		1 1/8		(†1 1/4)		1 11/16
1 13/16	1 1/8		1 1/4		1 1/4	1 13/16
2	1 1/4		1 3/8		1 3/8	2
2 3/16	1 3/8		1 1/2		1 1/2	2 3/16
2 3/8	1 1/2					2 3/8
2 9/16	1 5/8					2 9/16
2 3/4	1 3/4					2 3/4

*American Standard Machine Screw Nuts.
†American Standard, New Style.

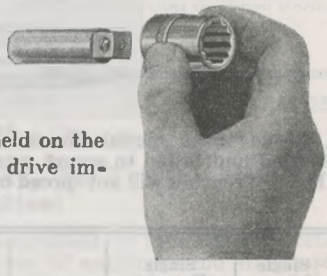
SOCKET WRENCHES

The Armstrong Drivelock Feature

Patented

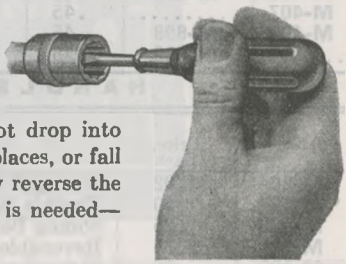
The Armstrong Drivelock is a simple, positive and optional means of locking any Socket to its respective Handle or Part. Also, combinations of Handles and Parts can be locked to each other.

To illustrate, connect the drive in the usual way, as shown below:



When connected, the Socket will be securely held on the drive. A quick pull, however, will disconnect the drive immediately.

To operate the Drivelock—connect the drive in the usual way as shown above. With an ordinary screw driver give the lock-pin a one-quarter turn:



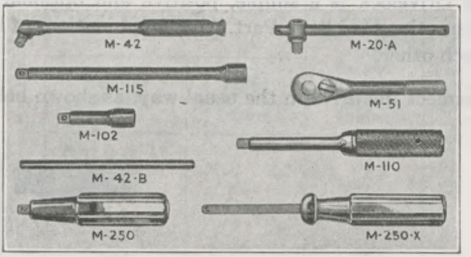
The Drive is now Locked—the socket cannot drop into moving machinery, cannot roll into inaccessible places, or fall on the operator. To release the Drivelock simply reverse the lock-pin a quarter turn. No special release key is needed—just an ordinary screw driver.

The Armstrong Drivelock Feature is incorporated in the drive of each Ratchet, Handle and Part in the Standard, Heavy Duty and Extra Heavy Duty Series as listed.

SOCKET WRENCHES

Miniature Series — 9/32" Square Drive
Chrome Vanadium Steel

These Sockets and Parts are invaluable for all work on nuts from 5/32" to 1/2", inclusive, across flats. Slim and tapered, they solve the assembly and service problem of Generators, Ignition Units, Radios and any other work requiring a secure grip for delicate adjustments.



Made from special Chrome Vanadium Steel, gauged to accurate limits, heat treated and tested to assure maximum strength. Finished in Chrome over Nickel. These Wrenches will not spread or break. All Sockets packed six to a cardboard box.

SOCKETS

Single Square (4 Point) No.	Single Hexagon (6 Point) No.	Price, Each	Size* Opening, Inches	Double Square (8 Point) No.	Double Hexagon (12 Point) No.	Price, Each	Size* Opening, Inches
.....	M-605	$0.45	5/32	M-810	M-1210	$0.45	5/16
M-406	M-606	.45	3/16	.....	M-1211	.45	11/32
M-407	.....	.45	7/32	M-812	M-1212	.45	3/8
M-408	M-608	.45	1/4	.....	M-1214	.45	7/16
.....	M-609	.45	9/32	.....	M-1216	.45	1/2

HANDLES AND PARTS

No.	Price, Each	Description	Extreme Length, Approx.	Approx. Weight, Ounces
M-20A	$1.02	Sliding T Handle	4 1/2	2
M-42	1.40	Flexible Head Handle	5 1/2	3
M-42B	.25	Sliding Bar for No. M-42	4 1/2	1 1/2
M-51	2.75	Reversible Ratchet	4	3 1/2
M-102	.85	Extension Bar	2	1
M-110	1.44	Extension. Spin-grip can be locked for use as a driver	5 1/2	6
M-115	1.08	Long Extension Bar	6	2 1/2
M-250	1.40	Moulded Shock-proof Handle	4	2
M-250X	1.54	Moulded Shock-proof Handle with extension	6	3

*For table of bolt, nut and cap screw sizes, see page 170.

SOCKET WRENCHES

Miniature Series — 5/32" Square Drive

ELECTRICAL SET NO. M-56

Chrome Vanadium Steel

This Set includes Miniature Sockets, Handles and Parts for the proper adjustment of Generators, Ignition Units, Radios and all extra small nuts in close quarters.

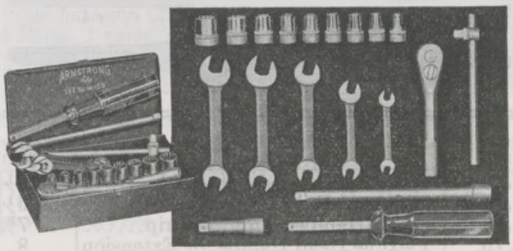
Nine Miniature Sockets; single hexagon openings 5/32, 3/16, 1/4, 9/32; double hexagon openings 5/16, 11/32, 3/8, 7/16 and 1/2 inch; Sliding T Handle, Long Extension, Short Extension and Reversible Ratchet. For a complete description of these tools, see page 172.

Price, Set No. M-56, complete with Steel Case $11.25
13 pieces. Approx. weight of set, 2 lbs.

COMBINATION ELECTRICAL SET NO. M-59

Chrome Vanadium Steel

This Combination Set includes a complete assortment of Miniature Sockets and Parts, with the addition of 5 Armstrong Vanadium 15° angle open end Miniature Wrenches as illustrated. These drop forged, extra small open end wrenches are fully described on page 153.



Nine Miniature Sockets, with Sliding T Handle, Long Extension, Short Extension. Reversible Ratchet and Moulded Shock-proof Handle with Extension; 5 open end Miniature Wrenches with 5/16 and 7/16, 1/4 and 9/32, 5/16 and 11/32, 3/8 and 7/16, 13/32 and 15/32 inch openings. A complete kit of the handiest Miniature Tools.

Price, Set No. M-59, complete with Steel Case $17.10
19 pieces. Approx. weight of set, 2½ lbs.

SOCKET WRENCHES

Double Hexagon (12 Point) Openings

Light Series — 3/8" Square Drive

Chrome Vanadium Steel

Thin head walls allow these Sockets to reach and grip the crowded or awkwardly placed nut. In close quarters, the double hexagon opening rotates the nut when the working arc is limited to only 30°.

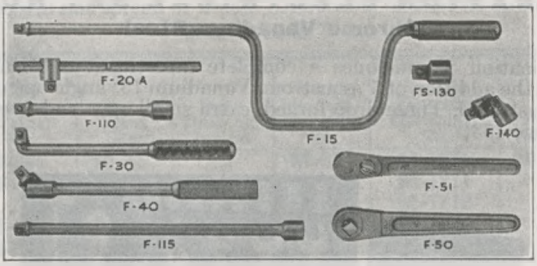
Made from Special Chrome Vanadium Steel, gauged to accurate limits, heat treated and tested to assure maximum strength. Finished in Chrome over Nickel. These wrenches will not spread or break. All Sockets packed six in a cardboard box.

SOCKETS

No.	Price, Each	Size* Opening	Approx. Weight, Ounces	No.	Price, Each	Size* Opening	Approx. Weight, Ounces
F-1208	$0.72	1/4	1/2	F-1216	$0.72	1/2	2
F-1210	.72	5/16	3/4	F-1218	.72	9/16	2 1/4
F-1211	.72	11/32	3/4	F-1220	.72	5/8	2 1/4
F-1212	.72	3/8	1 1/4	F-1222	.84	11/16	2 1/2
F-1214	.72	7/16	1 1/2	F-1224	.84	3/4	2 1/2

*For table of Bolt, Nut and Cap Screw sizes, see page 170.

HANDLES AND PARTS



No.	Price, Each	DESCRIPTION	Extreme Length.	Approx. Weight, Ounces
F-15*	$2.10	Speeder; Knurled Spin-grip	16 1/2	17
F-20A	1.35	Sliding T Handle	6 1/2	4
F-30	1.50	Offset Handle; Knurled Grip	7 3/4	8
F-40	2.70	Flexible Head Handle; or Extension	8	9
F-50	3.60	Drop Forged Ratchet;* with Plug Connector	6 1/2	8
F-51	4.50	Drop Forged Reversible Ratchet	7	9
F-110	1.08	Extension Bar	5 3/4	4
F-115	1.20	Long Extension Bar	10 1/2	8
F-140	2.46	Universal Joint		2
FS-130	1.02	Adapter; adapts 3/8" sq. Drive Handles to fit 1/2" sq. Drive Sockets		2

*For a complete description of Ratchets, see page 187.

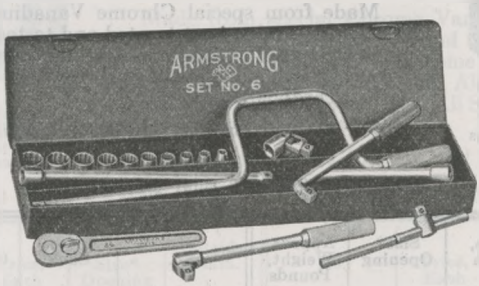
SOCKET WRENCHES

Light Series — 3/8" Square Drive

AVIATION SET NO. 6

Chrome Vanadium Steel

This Set is especially assembled to meet the requirements of aviation mechanics. A variety of handles and extensions enable the thin walled, 12 point sockets to reach the crowded or awkwardly placed nut. The correct wrench for any light job is quickly assembled from this set.



CONTENTS OF SET NO. 6

10 Sockets, double hexagon openings 1/4, 5/16, 11/32, 3/8, 7/16, 1/2, 9/16, 5/8, 11/16 and 3/4".
8 Handles and Parts, 1 each, Nos. F-15 Speeder, F-20A Sliding T Handle, F-30 Offset Handle, F-40 Flexible Head Handle, F-51 Reversible Ratchet, F-110 and F-115 Extension Bars and F-140 Universal Joint. For a complete description of these tools, see page 174.

Price, Set No. 6, complete with Steel Case $26.58
18 pieces. Approx. weight of set, 6½ lbs.

NOTE—Set No. 6-A, same as No. 6 less F-40 Flexible Head Handle, furnished when specified. Price $23.88

LIGHT UTILITY SET NO. 5

This Handy Set is the same as Set No. 6 described above, except it includes 7 double hexagon sockets only instead of 10. Openings 3/8, 7/16, 1/2, 9/16, 5/8, 11/16 and 3/4".

Price, Set No. 5, complete with Steel Case $24.42
15 pieces. Approx. weight of set, 6¼ lbs.

NOTE—Set No. 5-A, same as Set No. 5 less F-40 Flexible Head Handle, furnished when specified. Price $21.72

SOCKET WRENCHES

Standard Series — ½" Square Drive

HEXAGON AND SQUARE SOCKETS

Chrome Vanadium Steel

Double Hexagon 12 Point) Openings — Double Square (8 Point) Openings

These Sockets are furnished with double openings, both hexagon and square. Slim head walls enable these Sockets to operate with a sure grip in close or obstructed places.

Made from special Chrome Vanadium Steel, gauged to accurate limits, heat treated and tested to assure maximum strength. Finished in Chrome over Nickel. These Wrenches will not spread or break. All Sockets packed six in a cardboard box.

For Standard Series Handles and Parts, see page 178.

HEXAGON SOCKETS—(12 POINT OPENINGS)

No.	Price, Each	Size* Opening	Approx. Weight, Pounds	No.	Price, Each	Size* Opening	Approx. Weight, Pounds
S-1212	$0.72	3/8	1/8	S-1225	$0.90	25/32	1/4
S-1214	.72	7/16	1/8	S-1226	.90	13/16	1/4
S-1216	.72	1/2	1/8	S-1228	.90	7/8	5/16
S-1218	.72	9/16	1/8	S-1230	1.08	15/16	5/16
S-1219	.72	19/32	1/8	S-1231	1.08	31/32	3/8
S-1220	.72	5/8	3/16	S-1232	1.08	1	3/8
†S-1221	.72	21/32	3/16	S-1234	1.20	1 1/16	7/16
S-1222	.84	11/16	3/16	S-1236	1.32	1 1/8	1/2
S-1224	.90	3/4	1/4	S-1238	1.38	1 3/16	1/2
				S-1240	1.44	1 1/4	9/16

SQUARE SOCKETS—(8 POINT OPENINGS)

S-1410	$0.72	5/16	1/8	S-1420	$0.72	5/8	3/8
S-1412	.72	3/8	1/8	S-1422	.84	11/16	3/8
S-1414	.72	7/16	3/16	S-1424	.90	3/4	7/16
S-1416	.72	1/2	1/4	S-1426	.90	13/16	7/16
S-1418	.72	9/16	1/4	S-1428	.90	7/8	1/2
				S-1432	1.20	1	9/16

*For table of Bolt, Nut and Cap Screw sizes, see page 170.
†Special extra thin Wall Socket; fits Ford "A" Connecting Rod.

SOCKET WRENCHES

Standard Series — ½" Square Drive
EXTRA DEEP AND STRAIGHT WALL SOCKETS

Chrome Vanadium Steel

Extra Deep — Straight Wall
Double Hexagon (12 Point) Openings

These Sockets have straight, slim head walls to operate with the minimum amount of clearance consistent with strength and reliability.

The Extra Deep Sockets are furnished with openings 2⅝" deep for spark plugs, body bolts and U bolts.

Made from special Chrome Vanadium Steel, gauged to accurate limits, heat treated and tested to assure maximum strength. Finished in Chrome over Nickel. These Sockets will not spread or break. All extra Deep Sockets packed three in a cardboard box. All Straight Wall Sockets packed six in a cardboard box.

For standard Series Handles and Parts, see page 178.

EXTRA DEEP SOCKETS

No.	Price, Each	Size* Opening	Outside Diam.
SD-1216	$1.14	½	43/64
SD-1218	1.14	9/16	27/32
SD-1220	1.26	5/8	15/16
SD-1222	1.26	11/16	1
SD-1224	1.26	3/4	1 1/32
SD-1226	1.26	13/16	1 3/64
SD-1228	1.26	7/8	1 7/32
†SD-1228T	1.26	7/8	1 1/8
SD-1230	1.38	15/16	1 5/16
SD-1232	1.50	1	1 21/64
SD-1236	1.68	1 1/8	1 1/2

STRAIGHT WALL SOCKETS

No.	Price, Each	Size* Opening	Outside Diam.
ST-1214	$ 0.72	7/16	21/32
ST-1216	.72	½	23/32
ST-1218	.72	9/16	13/16
ST-1219	.72	19/32	27/32
ST-1220	.72	5/8	7/8
ST-1222	.84	11/16	1
ST-1224	.90	3/4	1 1/16
ST-1225	.90	25/32	1 1/16
ST-1226	.90	13/16	1 1/8
ST-1228	.90	7/8	1 3/16
ST-1230	1.08	15/16	1 1/4
ST-1232	1.08	1	1 3/8

*For table of Bolt, Nut and Cap Screw sizes, see page 170.
†Special extra thin Wall Socket for recessed Spark Plugs.

SOCKET SET NO. SD-5

Five Extra Deep Sockets with double hexagon openings 13/16", 7/8", 15/16", 1" and 1⅛" as listed above. Specially recommended for Spark Plug Service. Packed in cardboard box.

Price..... $7.08

Approx. Weight of Set, 3 lbs.

SOCKET SET NO. 12

Twelve Straight Wall double hexagon Sockets, 1 each numbers listed above. ST-1214 to ST-1232. Packed in cardboard box.

Price..... $10.20

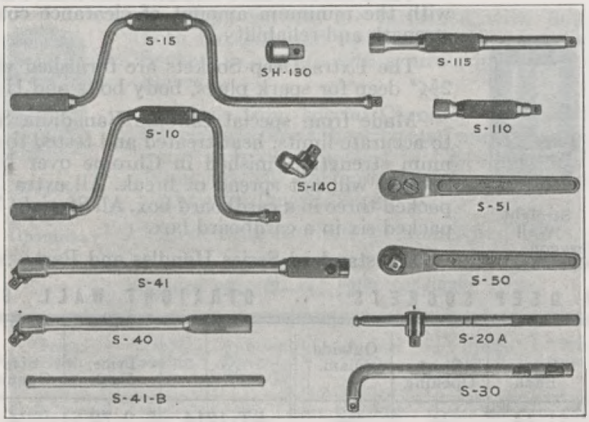
Approx. weight of Set, 2½ lbs.

SOCKET WRENCHES

Standard Series — ½" Square Drive
DRIVELOCK* HANDLES AND PARTS
Chrome Vanadium Steel

Made from special Chrome Vanadium Steel, gauged to accurate limits, heat treated and tested to assure maximum strength. Finished in Chrome over Nickel. These Handles and Parts will not spread or break.

For Standard Series Sockets, see pages 176 and 177.



No.	Price, Each	DESCRIPTION	Extreme Length, Approx.	Approx. Weight, Pounds
S-10	$2.70	Speeder; Knurled Spin-grips	14½	1¾
S-15	2.70	Long Speeder; Knurled Spin-grips	19½	2
S-20A	2.10	Sliding T Handle	11	1
S-30	1.25	Offset Handle	12	⅞
S-40	3.90	Flexible Head Handle; or Extension	12	1½
S-41	4.50	Long Flexible Head Handle; or Extension	17	2
S-41B	.65	Sliding Bar for No. S-41	12	¾
S-50	4.50	Drop Forged Ratchet; with Plug Connector†	10½	1⅛
S-51	6.75	Drop Forged Reversible Ratchet†	10½	1¼
S-110**	1.80	Extension Bar; Knurled Spin-grip	5¼	⅞
S-115**	2.10	Long Extension Bar; Knurled Spin-grip	10½	1¼
S-140	2.70	Universal Joint		¼
SH-130	1.20	Adapter; adapts ½" Sq. Drive. Handles to fit ¾" Sq. Drive Sockets		¼

*See page 171. †For a complete description of Ratchets, see page 187.
**Also furnished without Spin-Grip; No. S-110P $1.20; No. S-115P $1.65.

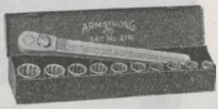
SOCKET WRENCHES

Standard Series — ½" Square Drive

"STANDARD TEN" SOCKET SETS Nos. 21 AND 21-R
Chrome Vanadium Steel

The "Standard Ten" Sets offer a compact assortment of the most necessary tools in the popular ½" square drive Standard Series.

Set No. 21



Set No. 21-R

These Sets include 10 double hexagon Sockets with the most used openings—$\frac{1}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{19}{32}$, $\frac{5}{8}$, $\frac{11}{16}$, $\frac{3}{4}$, $\frac{25}{32}$, $\frac{7}{8}$ and 1 inch.

Sets will be shipped without substitutions or extra parts unless specified.

SET NO. 21	SET NO. 21-R
Contains 10 Sockets with openings listed above and 1 No. S-41, 17" Flexible Head Drivelock* Handle which will operate at any angle or as an extension.	Contains 10 Sockets with openings listed above and 1 No. S-51 Reversible Drivelock* Ratchet.
Price, Set No. 21 ..... $14.70	Price, Set No. 21-R $16.47
11 Pieces, complete in steel case. Approx. weight of Set, 5 lbs.	11 Pieces, complete in steel case. Approx. weight of Set, 4½ lbs.

*See page 171.

SUBSTITUTIONS AND EXTRA PARTS

Straight Wall Sockets described on page 177 may be substituted in either set at the same price.

No. S-110 Extension is suggested as a handy extra part for either set; 5¼" long. Price **$1.80**

No. S-115 Long Extension for extra reach in either set; 10½" long. Price **$2.10**

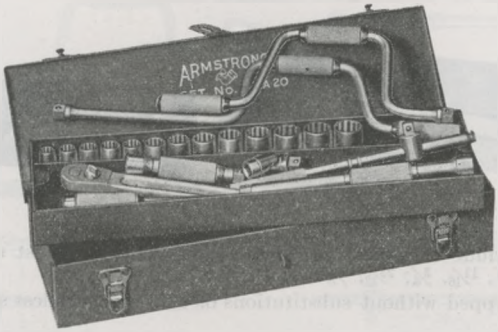
For additional extra parts, see page 178.

SOCKET WRENCHES

Standard Series — ¼" Square Drive

MOTOR SERVICE SET No. A-20

Chrome Vanadium Steel



Set No. A-20 is especially recommended for garage repair work. This Set covers the mechanic's general requirements with a wide selection of sockets and parts at a minimum outlay.

CONTENTS OF SET NO. A-20

13 Sockets, Double Hexagon Openings—7/16, 1/2, 9/16, 19/32, 5/8, 11/16, 3/4, 25/32, 13/16, 7/8, 15/16, 31/32 and 1".

8 Handles and Parts, 1 each, Nos. S-10 and S-15 Speeders, S-20A Sliding T Handle, S-41 Flexible Head Handle, S-51 Reversible Ratchet, S-110 and S-115 Extensions, and S-140 Universal Joint. For details, see pages 176-178.

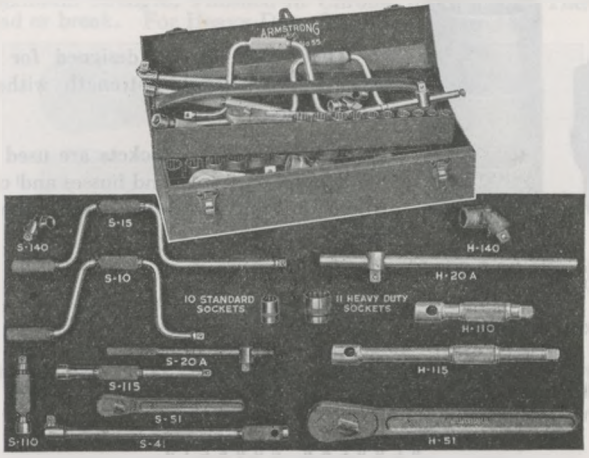
Price, Set No. A-20, complete with Steel Case $42.21

21 pieces. Approx. weight of Set, 21 lbs.

Note:—Set No. A-20B, same as Set No. A-20 less Flexible Head Handle S-41, furnished when specified. Price $37.71

SOCKET WRENCHES

SUPER-MECHANICS' SET No. 55
Chrome Vanadium Steel



The Super-Mechanics' Set No. 55 is a complete and compact assortment of Standard Series and Heavy Duty Series Sockets, Handles and Parts. All truck and bus service stations, machinery erectors and maintenance mechanics require the tools in this set.

CONTENTS OF SET NO. 55

Standard Pattern—½" square drive: 10 Sockets, double hexagon openings—7/16, ½, 9/16, 19/32, 5/8, 11/16, ¾, 25/32, 13/16 and 7/8"; 4 Handles, 1 Reversible Ratchet and 3 Parts as illustrated. For details, see pages 176-178.

Heavy Duty Pattern—¾" square drive: 11 Sockets, double hexagon openings—7/8, 15/16, 31/32, 1, 1 1/16, 1 1/8, 1 1/4, 1 3/8, 1 7/16, 1 ½ and 1 5/8"; 1 Handle, 1 Reversible Ratchet and 4 Parts as illustrated. For details, see page 182-183.

Price, Set No. 55, complete in Steel Tool Chest..... $88.85
35 pieces. Approx. weight of Set, 45 lbs.

SOCKET WRENCHES

Heavy Duty Series — ¾" Square Drive
REGULAR AND EXTRA DEEP SOCKETS
Chrome Vanadium Steel

Regular Extra Deep
Double Hexagon (12 Point) Openings

These Sockets are designed for heavy duty service where reliable strength without unnecessary weight is required.

The Extra Deep Sockets are used on heavy U bolts found on trucks and busses and on other jobs where the bolt protrudes beyond the nut farther than usual.

Made from special Chrome Vanadium Steel, gauged to accurate limits, heat treated and tested to assure maximum strength. Finished in Chrome over Nickel. These Sockets will not spread or break. All Regular Sockets packed two in a cardboard box. All Extra Deep Sockets packed three in a cardboard box.

For Heavy Duty Handles and Parts, see page 183.

REGULAR SOCKETS

No.	Price, Each	Size* Opening	Approx. Weight, Pounds	No.	Price, Each	Size* Opening	Approx. Weight, Pounds
H-1228	$1.08	7/8	5/16	H-1248	$1.86	1 1/2	1
H-1230	1.08	15/16	5/16	H-1252	2.16	1 5/8	1
H-1231	1.08	31/32	3/8	H-1254	2.70	1 11/16	1
H-1232	1.08	1	3/8	H-1256	2.70	1 3/4	1 1/4
H-1234	1.32	1 1/16	1/2	H-1258	2.95	1 13/16	1 1/4
H-1236	1.38	1 1/8	1/2	H-1260	2.95	1 7/8	1 1/4
H-1238	1.38	1 3/16	5/8	H-1264	3.50	2	1 3/8
H-1240	1.56	1 1/4	3/4	H-1266	4.10	2 1/16	1 3/8
H-1242	1.56	1 5/16	3/4	H-1268	4.40	2 1/8	1 1/2
H-1244	1.56	1 3/8	7/8	H-1270	4.70	2 3/16	1 1/2
H-1246	1.86	1 7/16	7/8	H-1272	5.30	2 1/4	1 3/4

EXTRA DEEP SOCKETS†

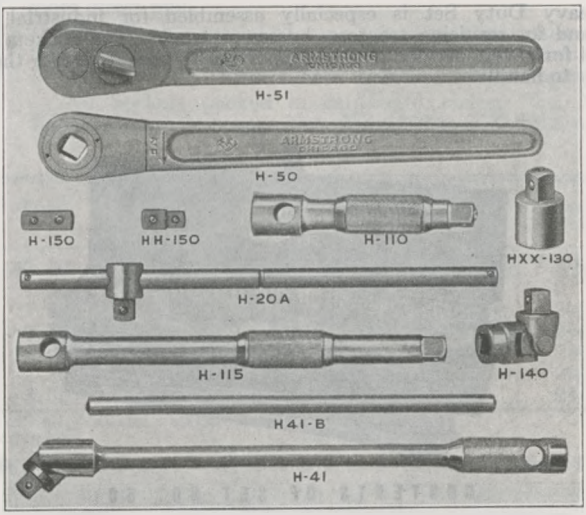
HD-1230	$1.62	1 5/16	3/4	HD-1240	$2.28	1 1/4	1 1/4
HD-1234	1.86	1 1/16	3/4	HD-1246	2.52	1 7/16	1 5/8

*For table of Bolts, Nut and Cap Screw sizes, see page 170.
†For ½" sq. drive Extra Deep Sockets, see Standard Series, page 177.

SOCKET WRENCHES

Heavy Duty Series — ¾" Square Drive
DRIVELOCK* HANDLES AND PARTS
Chrome Vanadium Steel

These Handles and Parts are designed for severe service. They are made from special Chrome Vanadium Steel, gauged to accurate limits, heat treated and tested to assure maximum strength. Finished in Chrome over Nickel. These Wrenches will not spread or break. For Heavy Duty Sockets, see page 182.



No.	Price Each	DESCRIPTION	Extreme Length, Approx.	Approx. Weight, Pounds
H-20A	$3.30	Sliding T Handles	17½	2¾
H-41	6.15	Flexible Head Handle	22	3¼
H-41B	1.10	Sliding Bar for No. H-41	16	2
H-50	10.50	Drop Forged Ratchet†; with plug-connector H-150	18½	4¾
H-51	11.50	Drop Forged Reversible Ratchet	19	5
H-110	2.70	Extension Bar; Knurled spin-grip	8	1½
H-115	3.30	Long Extension Bar; Knurled spin-grip	15½	2¾
HXX-130	1.50	Adapter; adapts ¾" sq. drive, handles to 1" sq. drive Sockets		½
H-140	7.50	Universal Joint		1⅛
H-150	1.20	Ratchet Plug Connector		¼
HH-150	1.50	Plug-Adapter; ¾" and ⅝" square		¼

*See page 171.
†For a complete description of Ratchets, see page 187.

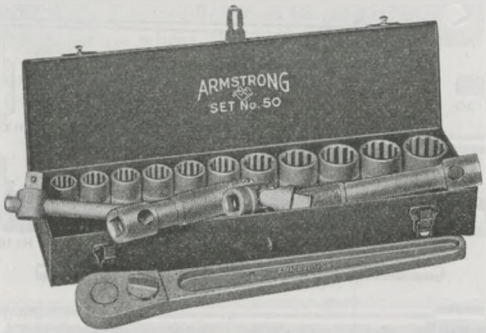
SOCKET WRENCHES

Heavy Duty Series — ¾" Square Drive

SET No. 50

Chrome Vanadium Steel

This Heavy Duty Set is especially assembled for industrial maintenance mechanics and for servicing tractors, busses or trucks. The Sockets and Handles are designed for severe service and in proportion to their strength they are exceptionally easy to handle.



CONTENTS OF SET NO. 50

11 Heavy Duty Sockets, with double hexagon openings—⅞, 15/16, 31/32, 1, 1 1/16, 1⅛, 1¼, 1 3/16, 1 1/16, 1½ and 1 5/8".

5 Handles and Parts, 1 each, Nos. H-20A Sliding T Handle, H-51 Reversible Ratchet, H-110 Extension Bar, H-115 Long Extension Bar and H-140 Universal Joint. For details see pages 182-183.

Price, Set No. 50, complete with Steel Case $48.20

16 pieces. Approx. weight of Set, 25½ lbs.

NOTE—Extra Deep Heavy Duty Sockets, page 182, may be included in Set No. 50 at $8.28 Extra (4 sockets).

SOCKET WRENCHES

Extra Heavy Duty Series — 1" Square Drive
Chrome Vanadium Steel

Double Hexagon (12 Point) Openings

These Sockets Wrenches are designed for the most severe service where extra strength is required. In addition to the 1" square drive hole the sockets are drilled to take a 7/8" diameter bar handle for a more direct pull.

Made from a special Chrome Vanadium steel, gauged to accurate limits, heat treated and tested to assure maximum strength. Finished in Chrome over Nickel. These wrenches will not spread or break.

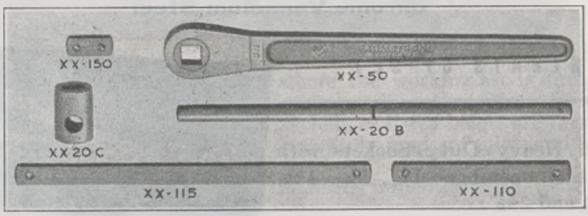
All Sockets packed in cardboard boxes; Nos. XX-1234 to XX-1248, two in a box; Nos. XX-1252 to XX-1280, one in a box.

SOCKETS

No.	Price, Each	Size* Opening	Approx. Weight, Pounds	No.	Price, Each	Size* Opening	Approx. Weight, Pounds
XX-1234	$1.80	1 1/16	1/2	XX-1258	$ 4.20	1 13/16	1 7/8
XX-1236	1.80	1 1/8	1/2	XX-1264	4.80	2	2 1/4
XX-1240	1.98	1 1/4	7/8	XX-1270	6.30	2 1/16	3
XX-1244	2.10	1 3/8	1	XX-1276	7.50	2 3/8	3 1/2
XX-1246	2.22	1 7/16	1 1/4	XX-1280	10.50	2 1/2	3 1/4
XX-1248	2.70	1 1/2	1 1/4	XX-1282†	12.00	2 9/16	4
XX-1252	3.00	1 5/8	1 1/2	XX-1288†	16.50	2 3/4	3 3/4

*For table of Bolt, Nut and Cap Screw sizes, see page 170.
†Without cross-hole.

DRIVELOCK* HANDLES AND PARTS



No.	Price, Each	DESCRIPTION	Extreme Length, Approx.	Approx. Weight, Pounds
XX-20B	$1.20	Sliding Bar	20	3 1/2
XX-20C	2.52	Drive Head; for XX-20B Bar		1 1/2
XX-50	16.20	Drop Forged Ratchet;**	20 1/2	6 1/2
XX-110	2.40	Extension Bar	9	2 1/4
XX-115	3.60	Long Extension Bar	18	4 1/4
XX-150	1.68	Ratchet Plug Connector		1/2

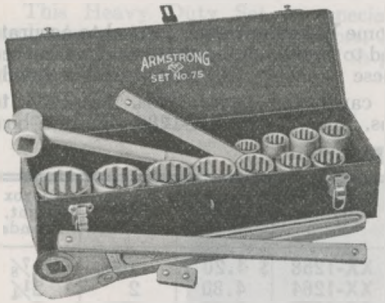
*See page 171.
**With plug connector. For a complete description of Ratchets, see page 187.

SOCKET WRENCHES

Extra Heavy Duty Series — 1" Square Drive

SET No. 75

Chrome Vanadium Steel



CONTENTS OF SET

11 Extra Heavy Duty Sockets with double hexagon openings—1 1/16, 1 1/8, 1 1/4, 1 5/16, 1 1/16, 1 1/2, 1 5/8, 1 13/16, 2, 2 3/16 and 2 3/8".

5 Handles and Parts, 1 each Nos. XX-20B, XX-20C, XX-50, XX-110 and XX-115. For details, see page 185.

Price, Set No. 75, complete with Steel Case $69.90
16 pieces. Approx. weight of Set, 41 lbs.

SET No. 80

Chrome Vanadium Steel

CONTENTS OF SET

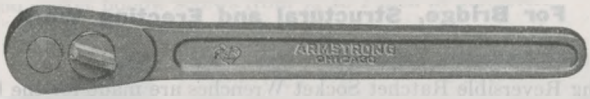
7 Extra Heavy Duty Sockets with double hexagon openings—1 1/4, 1 1/16, 1 5/8, 1 13/16, 2, 2 3/16 and 2 3/8".

3 Handles and Parts, 1 each Nos. XX-20B, XX-20C and XX-110. For details, see page 185.

Price, Set No. 80, complete with Steel Case $40.02
10 pieces. Approx. weight of Set, 26 lbs.

SOCKET WRENCHES

Armstrong Reversible Ratchets
Drop Forged Steel

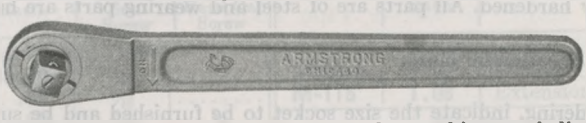


These Ratchets can be instantly reversed by snapping the reversing lever to position ON or position OFF. This feature is particularly convenient for close quarter operations. The Ratchets will rotate the socket where the working arc is limited to only 15°. All parts are made entirely of alloy and high tensile steel, carefully heat treated to maximum strength. Improved design prevents the excessive wear and looseness common to the ordinary reversible ratchet.

Finished in Chrome over Nickel with the heads buffed bright.

No.	Price, Each	Series	Drive	Extreme Length Approx.	Approx. Weight, Pounds
M-51	$2.75	Miniature	5/16" Square	4	1/4
F-51	4.50	Light	3/8" Square	7	1/2
S-51	6.75	Standard	1/2" Sq. Drivelock*	10 1/2	1 1/4
H-51	11.50	Heavy Duty	3/4" Sq. Drivelock*	19	5

Armstrong Regular Ratchets
Drop Forged Steel



These Ratchets will rotate the socket where the working arc is limited to only 15°. In this style, turning the Ratchet over reverses its action. No. S-50 is furnished with locked-in plug connector. All other Ratchets as listed below are furnished with removable plug connectors. All parts are accurately made of alloy and high tensile steel, heat treated to maximum strength.

Finished in Chrome over Nickel with the heads buffed bright.

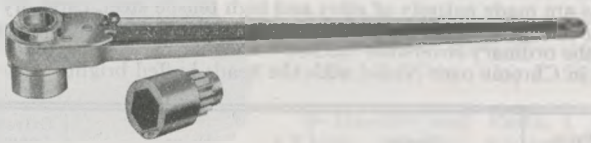
No.	Price, Each	Series	Drive	Extreme Length, Approx.	Approx. Weight, Pounds
F-50-A	$3.60	For Refrigerator Service	1/4" Square	6 1/2	1/2
F-50-B	3.60	For Refrigerator Service	5/16" Square	6 1/2	1/2
F-50	3.60	Light	3/8" Square	6 1/2	1/2
S-50	4.50	Standard	1/2" Sq. Drivelock*	10 1/2	1 1/8
H-50	10.50	Heavy Duty	3/4" Sq. Drivelock*	18 1/2	4 3/4
XX-50	16.20	Extra Heavy Duty	1" Sq. Drivelock*	20 1/2	6 1/2

*For description of the Drivelock Feature, see page 171.

REVERSIBLE RATCHET SOCKET WRENCHES

For Bridge, Structural and Erecting Work

Armstrong Reversible Ratchet Socket Wrenches are made for the hardest kind of service. They are stronger and will outwear other wrenches of this type. They are instantly reversible while in use.



The open spindle and socket allow the bolt to pass through the socket and ratchet head. Consequently nuts can be run for any distance along a bolt and securely set with a minimum of time and effort.

The handle or wrench is drop-forged of steel and heat treated. No castings are used in this wrench. The sockets and gears are machined from solid selected steel and properly hardened. All parts are of steel and wearing parts are hardened.

Finished in cadmium plate.

When ordering, indicate the size socket to be furnished and be sure to specify whether hexagon or square.

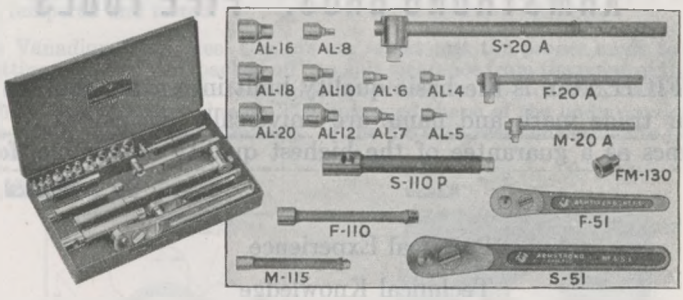
No.	Price, Wrench With One Socket	Nominal Socket Openings Hexagon or Square, Short Diameter Across Flats	Extra Sockets, Each	Length of Handle, Approx.	Approx. Weight of Wrench Pounds
2-BR	$10.00	1, 1 1/16, 1 1/8, 1 1/4, 1 5/16, 1 3/8, 1 7/16, 1 1/2, 1 5/8, 1 13/16, 1 7/8, 2, 2 3/16*	$3.00	24	10
3-BR	20.00	1 5/8, 1 13/16, 2, 2 3/16, 2 1/4*, 2 3/8, 2 9/16, 2 3/4, 2 15/16, 3, 3 1/8	6.00	36	23

*Hexagon only.

HOLLOW SCREW WRENCHES

Sets Nos. AL-100 and AL-50

These Sets provide detachable head wrenches, handles, extensions and ratchets for all hexagon socket hollow screws from ¼ to 1 inch in diameter.



Made from special Chrome Vanadium Steel, gauged to accurate limits, heat treated and tested to assure maximum strength. Finished in Chrome over Nickel. These Handles and Parts will not spread or break. For complete description of Handles and Parts, see pages 172-178.

DETACHABLE WRENCHES

No.	Price Each	Fits Socket Set Screw	Fits Socket Head Cap Screw
	*¼" Square Drive		
AL- 4	$0.60	¼	.....
AL- 5	.60	5/16	.....
AL- 6	.60	3/8	¼
	3/8" Square Drive		
AL -7	$0.75	7/16	5/16
AL -8	.75	½	.....
AL-10	.75	5/8	3/8 & 7/16
	½" Square Drive		
AL-12	$0.85	¾	½ & 9/16
AL-16	.85	7/8	5/8
AL-18	.85	1	¾ & 7/8
AL-20	.85	.....	1

HANDLES AND PARTS

No.	Price Each	Description
	9/32" Square Drive	
M-20-A	$1.02	Sliding T Handle
M-115	1.08	Extension
	3/4" Square Drive	
F-20-A	$1.35	Sliding T Handle
F-51	4.50	Reversible Ratchet
F-110	1.08	Extension
FM-130	.90	Adapter—3/8" sq. hole and 9/32" sq. plug
	½" Square Drive	
S-20-A	$2.10	Sliding T Handle
S-51	6.75	Reversible Ratchet
S-110-P	1.20	Extension

Set No. AL-100—Consists of 1 each of all Sockets, Handles and Parts listed above—19 pieces.

Price, complete in fitted steel case..... $25.00

Set No. AL-50—Consists of 1 each of Nos. AL-4, AL-5, AL-6, AL-7, AL-8, F-51, F-20-A, F-110, M-20-A, M-115 and FM-130—11 pieces.

Price, complete in steel case..... $13.00

*Previously ¼ sq. drive. Unless ¼" drive is specified on order, 5/16" sq. drive will always be furnished.

"ARMSTRONG BROS." PIPE TOOLS

EFFICIENCY is the basic quality built into every tool we make, and our trade mark and name are universally recognized by expert mechanics as a guarantee of the highest quality obtainable, founded upon

Practical Experience
Technical Knowledge
Modern Plant and Equipment
Scientific Methods

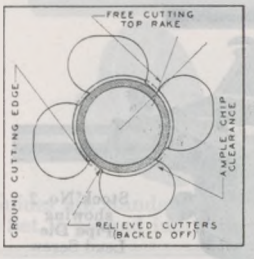
Forty years of experience as designers and makers of High Grade Tools, and our excellent system of Jigs, Gauges, Tests, and inspection insures our ability to deliver Pipe Tools of Superior Quality at Fair Prices which will merit and hold the wide preference given Armstrong Tools by skilled workers in other lines.

In Ordering Specify "ARMSTRONG BROS." Pipe Tools.

"ARMSTRONG BROS." SOLID PIPE DIES

These Dies excel in easy cutting, long lasting qualities due to their improved design, superior material and excellent workmanship. They are carefully hardened, drawn, tempered and tested.

The Vanadium Tool Steel Chasers are set at just the proper angle to give the best cutting rake and are "backed off" to give clearance from the point of the cutting teeth. This is the only cutter form which produces the easy cutting, uniformity and smoothness of a lathe cut thread. The improved shape of the body provides ample chip clearance, preventing "jamming" of the die with resultant injury to both work and tools.



These Dies fit any stock of standard dimensions.

Furnished either right or left hand in sizes listed. Right hand American National Standard (Briggs) Dies will be sent if not otherwise specified in order. Each Die is boxed separately.

For selected sets complete with stock, see page 193.

For Stock No.	Dimensions of Dies	For Threading Pipe Size	Price Each, * Right Hand	For Stock No.
0	2 x 2 x ½	⅛, ¼, ⅜, ½	$1.40	0
1	2½ x 2½ x ¾	⅛, ¼, ⅜, ½, ¾, 1	1.60	1
1½	3 x 3 x ¾	⅛, ¼, ⅜, ½, ¾, 1, 1¼, 1½	2.00	1½
2	4 x 4 x ⅞	½, ¾, 1, 1¼, 1½, 2	2.50	2

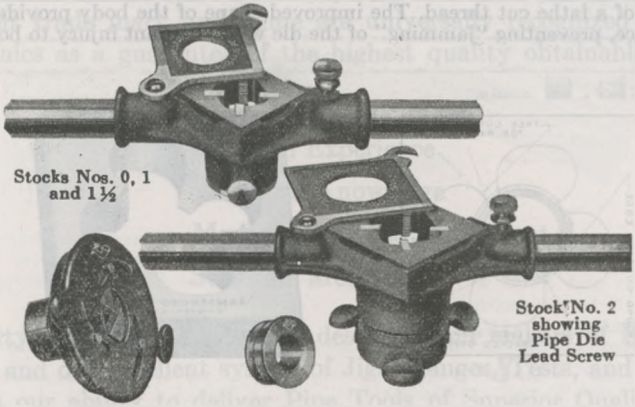
*Left Hand Dies take double the list of Right Hand Dies.

NOTE—Dies for threading I.P.S. brass and copper pipe can be furnished when specified at prices listed above. These dies are marked (Brass Pipe Only).

"ARMSTRONG BROS." STOCKS FOR SOLID DIES

Cadmium Finish

These Stocks will fit any solid pipe or bolt die of standard dimensions. The bodies are certified malleable iron. Handles and name plates are smoothly burnished. The No. 2 pipe stock is equipped with a lead screw, 11½ pitch thread, as shown.



Ring Guides are always furnished unless Adjustable is specified. For complete description of Adjustable Guides, see page 201.

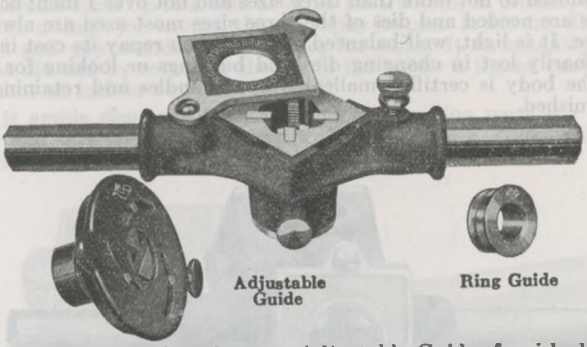
Stock Number	0	1	1½	2
Approx. Weight, Pounds	2¾	5¼	6¼	12½
For Dies, Dimensions	2x2x½	2½x2½x¾	3x3x¾	4x4x¾
Stock Complete without Dies or Guides.	$3.00	$3.50	$4.00	$8.50
Ring Guides, pipe or bolt, each	.30	.40	.60	.75
Adjustable Pipe Guides	4.50	5.00	6.00	
Extra Lead Screws, each				2.00
Extra Handles, per pair	.75	1.25	1.50	2.00
Extra Name Plates, each	.40	.60	.80	1.00
Extra Screws, each	.20	.30	.30	.30

For prices of Dies, see pages 191 and 196.
For Stocks with selected Sets of Dies, see pages 193 and 197.

"ARMSTRONG BROS." SOLID PIPE DIES

In Sets With Stock
Cadmium Finish

Each Set consists of one stock, complete with an assortment of dies and guides as listed. Right Hand American National Standard (Briggs) dies will always be sent if not otherwise specified in order.



Ring Guides are standard equipment; Adjustable Guides furnished when specified. Each Set is packed individually in a wooden box.

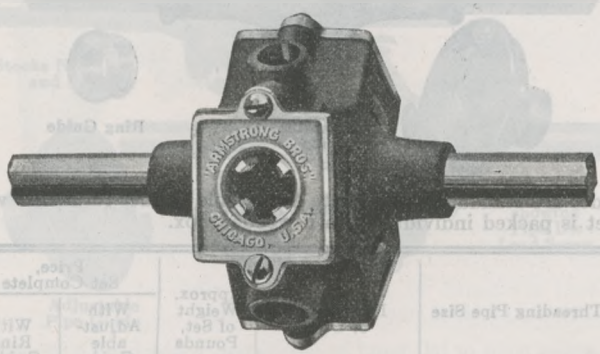
Set No.	For Threading Pipe Size	Dimensions of Dies	Approx. Weight of Set, Pounds	Price, Set Complete		Set No.
				With Adjustable Guide	With Ring Guides	
0	⅛, ¼, ⅜, ½	2 x 2 x ½	6½	$9.80	$8.00	0
1	¼, ⅜, ½, ¾, 1	2½ x 2½ x ¾	13	12.50	10.50	1
1-2	½, ¾	2½ x 2½ x ¾	11½	8.25	6.00	1-2
1-3	½, ¾, 1	2½ x 2½ x ¾	12	9.75	7.50	1-3
1-4	⅜, ½, ¾, 1	2½ x 2½ x ¾	12½	11.25	9.00	1-4
1-5	⅛, ¼, ⅜, ½, ¾	2½ x 2½ x ¾	13	12.50	10.50	1-5
1-6	⅛, ¼, ⅜, ½, ¾, 1	2½ x 2½ x ¾	14	14.00	12.00	1-6
1½	¾, 1, 1¼	3 x 3 x ¾	14	12.00	9.50	1½
1½-4	½, ¾, 1, 1¼	3 x3 x ¾	16	14.00	11.50	1½-4
1½-5	⅜, ½, ¾, 1, 1¼	3 x 3 x ¾	18	16.50	14.00	1½-5
1½-6	¼, ⅜, ½, ¾, 1, 1¼	3 x 3 x ¾	22	18.00	15.50	1½-6
2	1¼, 1½, 2	4 x 4 x ⅞	25		14.50	2
2-4	1, 1¼, 1½, 2	4 x 4 x ⅞	29		17.00	2-4
2-5	¾, 1, 1¼, 1½, 2	4 x 4 x ⅞	33		19.50	2-5
2-6	½, ¾, 1, 1¼, 1½, 2	4 x 4 x ⅞	37		22.00	2-6

For price list of Dies, Stocks and parts of same, see pages 191 and 192.
For complete description of Adjustable Pipe Guides, see page 201.

"ARMSTRONG BROS." TRIPLEX STOCK WITH SOLID PIPE DIES

Cadmium Finish

This Stock is very convenient for use under conditions where the range of the pipe used is limited to not more than three sizes and not over 1 inch; no loose bushings or guides are needed and dies of the three sizes most used are always in place for instant use. It is light, well balanced and will soon repay its cost in time saved which is ordinarily lost in changing dies and bushings or looking for them when misplaced. The body is certified malleable iron; handles and retaining plates are smoothly burnished.



Unless otherwise specified, ½, ¾ and 1-inch Right Hand American National Standard (Briggs) Dies will be sent. If desired, a ⅛, ¼ or ⅜-inch die can be furnished in place of the 1-inch die. Each Set is packed individually in a wooden box.

Triplex Set No.	Dimensions of Dies, 2½x2½x¾	Approx. Weight Complete Pounds	Price Stock Only Without Dies	Price* Extra Dies Right Hand	Price Complete	Triplex Set No.
1-T	Triplex Stock with three Dies.....	11½	$7.50	$1.60	$12.25	1-T

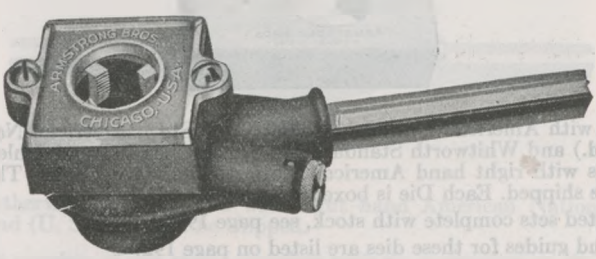
*Left Hand Dies take double the list of Right Hand Dies.

"ARMSTRONG BROS." REVERSIBLE RATCHET STOCKS with SOLID PIPE DIES

Cadmium Finish

This Stock is indispensable on certain classes of work such as threading pipe in awkward corners close up to a wall or other obstruction, in ditches, etc., and it will often save on a single job enough time to repay its cost. It fits any die of the dimensions listed and any standard size guides for same. It is instantly reversible for backing the die and by reversing the die in the holder a thread can be cut on pipe projecting but an inch or two from the wall.

There is ample clearance for chips and the working parts are well protected from sand and dirt. The body is certified malleable iron. Name plate and handle are smoothly burnished.



Each Set consists of one reversible ratchet stock with an assortment of dies and guides as listed. Right hand American National Standard (Briggs) Dies will always be sent if not otherwise specified in order. No. 2-R stock is equipped with a lead screw.

Each Set is packed individually in a wooden box.

Set No.	For Threading Pipe Size	Dimensions of Dies	Approx. Weight of Set Pounds	Price Stock Only	Price* Extra Dies Right Hand	Price of Set Complete	Set No.
1-R	⅜, ½, ¾, 1	2½x2½x¾	8¾	$7.50	$1.60	$15.00	1-R
1-R-6	⅛, ¼, ⅜, ½, ¾, 1	2½x2½x¾	11¼	7.50	1.60	19.00	1-R-6
2-R	1, 1¼, 1½, 2	4 x4 x⅞	27	12.50	2.50	24.75	2-R
2-R-6	½, ¾, 1, 1¼, 1½, 2	4 x4 x⅞	34	12.50	2.50	31.25	2-R-6

*Left Hand Dies take double the list of Right Hand Dies.
NOTE—Solid Bolt Dies, listed on page 196, can also be used in this stock.

"ARMSTRONG BROS." SOLID BOLT DIES

These Dies have Special Vanadium Tool Steel "backed-off" chasers making them easy cutting and long lasting; qualities which are of first importance in a tool of this character. The teeth of these Dies are carefully hardened, drawn, tempered and tested.

These Dies fit any stock of standard dimensions.

In stock with American National Coarse (U. S. Std.), American National Fine (S. A. E. Std.) and Whitworth Standard right or left hand thread. Unless otherwise specified dies with right hand American National Standard Coarse Thread (U. S. Std.), will be shipped. Each Die is boxed separately.

For selected sets complete with stock, see page 197.

Stocks and guides for these dies are listed on page 192.

For Stock, No.	Dimensions of Dies	For Threading Bolts Diameter	Price* Each, Right Hand	For Stock No.
0	2 x2 x1½	¼, 5/16, ⅜, 7/16, ½, 9/16, ⅝, 11/16, ¾	$1.50	0
1	2½x2½x¾	¼, 5/16, ⅜, 7/16, ½, 9/16, ⅝, 11/16, ¾, 13/16, ⅞, 15/16, 1, 1⅛, 1¼	2.00	1
1½	3 x3 x¾	¾, 13/16, ⅞, 15/16, 1, 1⅛, 1¼, 1⅜, 1½	2.50	1½
2	4 x4 x⅞	1, 1⅛, 1¼, 1⅜, 1½, 1⅝, 1¾, 1⅞, 2	3.50	2

*Left Hand Dies take double the list of Right Hand Dies.

LIST OF STANDARD BOLT THREADS

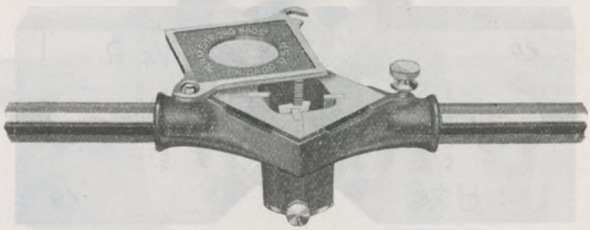
Diameter Bolts.....	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1	1⅛	1¼
N. C. (U. S. Standard)	20	18	16	14	13	12	11	10	9	8	7	7
N.F.(S.A.E. Standard)	28	24	24	20	20	18	18	16	14	14	12	12
Whitworth Standard .	20	18	16	14	12	12	11	10	9	8	7	7

"ARMSTRONG BROS." SOLID BOLT DIES IN SETS WITH STOCKS

Cadmium Finish

The stocks in these sets are our regular pipe stocks listed and described on page 192, the dies are described and listed on page 196.

These Bolt Dies are made for American National Coarse (U. S. Std.), American National Fine (S. A. E. Std.) and British (Whitworth) Standard thread.



Unless otherwise specified dies with right hand American National Standard Coarse thread (U. S. Std.) will be shipped.

Each Set consists of one stock complete with an assortment of dies and guides as listed; packed individually in a wooden box.

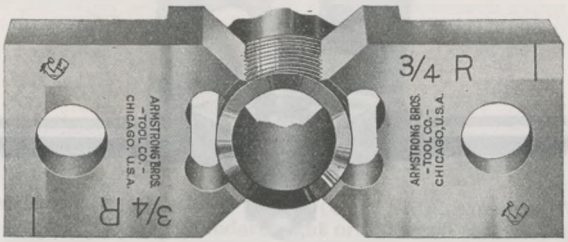
Set No.	For Threading Bolts Diameter	Dimensions of Dies	Approx. Weight Set, Pounds	Price Set, Complete
0-B-2	¼, 5/16, 3/8, 7/16, ½	2 x2 x½	6½	$11.00
0-B-3	¼, 3/8, ½, 5/8, ¾	2 x2 x½	6½	11.00
0-B-4	¼, 5/16, 3/8, 7/16, ½, 5/8, ¾	2 x2 x½	8	14.00
1-B-1	½, 5/8, ¾, 7/8, 1	2½x2½x¾	13	15.00
1-B-2	¼, 3/8, ½, 5/8, ¾, 7/8, 1	2½x2½x¾	15	19.00
1-B-3	¼, 5/16, 3/8, 7/16, ½, 5/8, ¾	2½x2½x¾	16	19.00
1-B-4	½, 5/8, ¾, 7/8, 1, 1⅛, 1¼	2½x2½x¾	15	19.00
1-B-5	¼, 5/16, 3/8, 7/16, ½, 5/8, ¾, 7/8, 1	2½x2½x¾	18	23.00
1-B-6	¼, 5/16, 3/8, 7/16, ½, 5/8, ¾, 7/8, 1, 1⅛, 1¼	2½x2½x¾	18½	27.00
1½-B-1	¾, 1, 1¼, 1½	3 x3 x¾	16½	16.00
1½-B-2	¾, 7/8, 1, 1⅛, 1¼, 1½	3 x3 x¾	19½	21.00

For extra Guides, see page 192.
For list of Standard Bolt Threads, see page 196.

"ARMSTRONG BROS." ADJUSTABLE PIPE DIES

Made of Special Vanadium Tool Steel with Backed off Chasers. In these Dies are incorporated every desirable feature, among which are the following: Correct Cutting Angle or Rake; "Backed Off" Chasers or Cutting Teeth; Correct Throat Angle; Ample Chip Clearance; Special Vanadium Tool Steel. These Dies are easy to start on the pipe, cut fast, easy and clean and back off smoothly without jamming or tearing.

Our modern hardening and tempering methods and equipment together with the exceptionally high quality of material and rigid inspection and tests insure maximum wear and service.



Our dies fit any Stock adapted for this type of die and are furnished either right hand or left hand in the sizes listed.

In stock for American National Standard (Briggs) and British (Whitworth) Standard threads. Unless otherwise specified Right Hand American National Standard (Briggs) Thread Dies will be shipped. Each Die is boxed separately.

For selected sets complete with stock, see page 200.

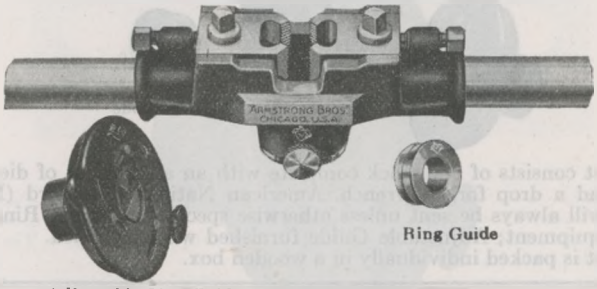
For Stock No.	For Threading Pipe Size	Width Die	Price* Per Pair Right Hand	For Stock No.
1-A	1/8, 1/4, 3/8, 1/2, 3/4	1	$1.60	1-A
2-A	1/8, 1/4, 3/8, 1/2, 3/4, 1	1 1/2	2.00	2-A
2 1/2-A	1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2	1 3/4	2.50	2 1/2-A
2 1/2-A	1/2 & 3/4, 1 & 1 1/4 (Dbl. end dies)	1 3/4	3.50	2 1/2-A
3-A	1/2, 3/4, 1, 1 1/4, 1 1/2, 2	2 1/2	3.50	3-A
6-A	2, 2 1/2, 3	3 5/8	8.50	6-A

*Left Hand Dies take double the list of Right Hand Dies.
NOTE—Dies for threading I.P.S. brass and copper pipe can be furnished when specified at prices listed above. These Dies are marked (Brass Pipe Only).

"ARMSTRONG BROS." STOCKS FOR ADJUSTABLE DIES

Cadmium Finish

These Stocks, while adapted for the use of any standard die of this type, are of new and improved design presenting a smooth compact body, without sharp edges or ribs, which fits snugly and comfortably into the hand. The Bodies are Certified Malleable Iron, carefully machined. Handles are smoothly burnished.



Ring Guide

Adjustable Pipe Guide

Ring Guides are always furnished unless Adjustable is specified. For complete description of Adjustable Guides, see page 201.

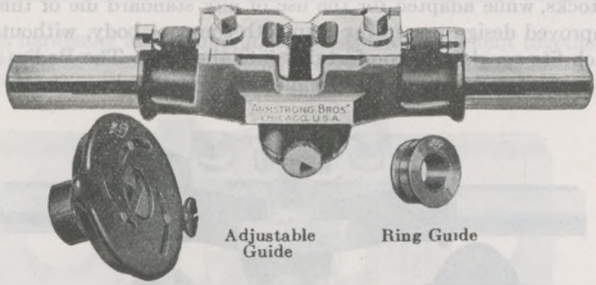
Stock Number	1-A	2-A	2½-A	3-A	6-A
Approx. Weight, Pounds	2½	5¼	6¾	12¼	60
Stock complete, without Dies or Guides	$3.25	$4.00	$5.25	$7.00	$36.00
Ring Guides, Pipe or Bolt, each	.30	.40	.60	.75	2.00
Adjustable Pipe Guides	4.50	5.00	6.00	8.00	
Extra Handles, per pair	.75	1.25	1.25	2.50	(4)7.00
Extra Wrenches, each	.20	.25	.25	.30	.55
Extra Collar Screw, each	.25	.30	.35	.50	.70
Extra Guide Screw, each	.20	.30	.30	.50	.60
Extra Adjusting Screw, each	.20	.20	.35	.40	.50

For prices of Dies, see page 198.
For Stocks with selected Sets of Dies, see page 200

"ARMSTRONG BROS." ADJUSTABLE PIPE DIES IN SETS WITH STOCKS

Cadmium Finish

These Dies are made from Special Vanadium Tool Steel with "backed off" chasers making them easy cutting and long lasting.



Adjustable Guide — Ring Guide

Each Set consists of one stock complete with an assortment of dies and guides as listed and a drop forged wrench. American National Standard (Briggs) right hand dies will always be sent unless otherwise specified in order. Ring Guides are standard equipment; Adjustable Guide furnished when specified.

Each Set is packed individually in a wooden box.

Set No.	For Threading Pipe Size	Approx. Weight of Set, Pounds	Price, Set Complete		Set No.
			With Adjustable Guide	With Ring Guides	
1-A	⅛, ¼, ⅜, ½	5	$10.80	$ 9.00	1-A
1-A-5	⅛, ¼, ⅜, ½, ¾	5⅛	12.00	10.25	1-A-5
2-A	¼, ⅜, ½, ¾, 1	12	14.00	12.00	2-A
2-A-3	½, ¾, 1	10¼	10.50	8.75	2-A-3
2-A-4	⅜, ½, ¾, 1	11¼	12.25	10.50	2-A-4
2-A-6	⅛, ¼, ⅜, ½, ¾, 1	13	16.00	14.00	2-A-6
2½-A	½ & ¾, 1 & 1¼ (see note)	14	16.50	14.00	2½-A
2½-A-4	¼, ⅜, ½ & ¾, 1 & 1¼ (see note)	18	21.50	19.00	2½-A-4
2½-A-5	½, ¾, 1, 1¼, 1½	16¾	19.00	16.50	2½-A-5
2½-A-6	⅜, ½, ¾, 1, 1¼, 1½	18	21.50	19.00	2½-A-6
3-A	1¼, 1½, 2	29	21.00	18.00	3-A
3-A-4	1, 1¼, 1½, 2	32	24.00	21.00	3-A-4
3-A-5	¾, 1, 1¼, 1½, 2	37	27.00	24.00	3-A-5
3-A-6	½, ¾, 1, 1¼, 1½, 2	41	30.00	27.00	3-A-6
6-A-2	2½, 3	80		50.00	6-A-2

NOTE—½ and ¾, 1 and 1¼ Dies in No. 2½-A and No. 2½-A-4 sets are double end Dies.

For price list of Dies, Stocks and Parts of same, see pages 198 and 199

"ARMSTRONG BROS." ADJUSTABLE PIPE GUIDE

Cadmium Finish

This Pipe Guide may be used in place of the individual or ring type of guide. It can be instantly adjusted and centers the stock accurately at all times, the jaws being locked at the desired position by a thumb screw.

The body is Certified Malleable Iron; thrust pins are integral with jaw segments which are hardened.

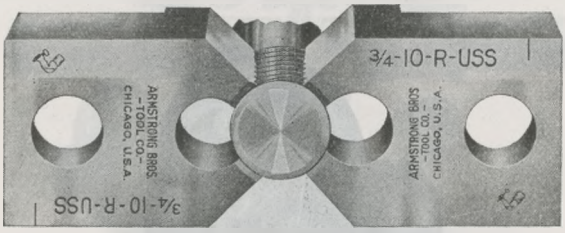
No.	Fits Stocks, Nos. For Adjustable Pipe Dies	Fits Stocks, Nos. For Solid Pipe Dies	Capacity Diameter Pipe	Approx. Weight Each, Pounds	Extra Jaws, Each	Extra Thumb Screws, Each	Extra Machine Screws, Each	Price Complete
291	1-A	0	⅛ to ½	1	$0.45	$0.16	$0.08	$4.50
292	2-A	1	⅛ to 1	1⅝	.50	.20	.08	5.00
*292½	2½-A	1½	¼ to 1¼	2	.60	.24	.08	6.00
293	3-A	.....	½ to 2	5	.80	.24	.12	8.00

*Orders for No. 292½ Adjustable Guide must state whether for use in No. 2½-A or No. 1½ stock.

"ARMSTRONG BROS." ADJUSTABLE BOLT DIES

These Dies are made of Special Vanadium Tool Steel with "backed off" chasers. They are carefully hardened, drawn, tempered and tested.

"Armstrong Bros." dies are easy to start, cut fast, easy and clean and back off smoothly without jamming or tearing.



These Dies fit any stock of standard dimensions.

In stock with American National Coarse (U. S. Std.), American National Fine (S. A. E. Std.) and Whitworth Standard right or left hand thread. Unless otherwise specified dies with right hand American National Standard Coarse Thread (U. S Std.) will be shipped. Each Die is boxed separately.

For selected sets complete with stock, see page 203.

Stocks and guides for these dies are listed on page 199.

For Pipe Stock No.	For Threading Bolts Diameter	Width of Die	*Price Per Pair, Right Hand	For Pipe Stock No.
1-A	1/4, 5/16, 3/8, 7/16	1	$1.50	1-A
1-A	1/2, 9/16, 5/8, 3/4	1	1.75	1-A
2-A	1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 3/4, 7/8, 1	1 1/2	2.00	2-A
2-A	1 1/8, 1 1/4	1 1/2	2.25	2-A
3-A	1, 1 1/8, 1 1/4, 1 3/8, 1 1/2, 1 5/8, 1 3/4, 1 7/8, 2	2 1/2	5.00	3-A

*Left Hand Dies take double the list of Right Hand Dies.

LIST OF STANDARD BOLT THREADS

Diameter Bolts	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
N. C. (U. S. Standard)	20	18	16	14	13	12	11	10	9	8	7	7
N. F. (S. A. E. Standard)	28	24	24	20	20	18	18	16	14	14	12	12
Whitworth Standard	20	18	16	14	12	12	11	10	9	8	7	7

"ARMSTRONG BROS." ADJUSTABLE BOLT DIES IN SETS WITH STOCKS

Cadmium Finish

The stocks in these sets are our regular pipe stocks listed and described on page 199 and the dies described and listed on page 202.

These Bolt Dies are made for American National Coarse (U. S. Std.), American National Fine (S. A. E. Std.) and British (Whitworth) Standard Thread.

Unless otherwise specified, dies with right hand American National Coarse Thread (U. S. Std.) will be shipped.

Each Set consists of one stock complete with an assortment of dies and guides as listed and a drop forged wrench; packed individually in a wooden box.

Set No.	For Threading Bolts Diameter	Approx. Wgt. Set Lbs.	Price Set Complete	Set No.
1-AB-2	1/4, 5/16, 3/8, 7/16, 1/2	4 3/4	$11.50	1-AB-2
1-AB-3	1/4, 3/8, 1/2, 5/8, 3/4	4 1/2	12.00	1-AB-3
1-AB-4	1/4, 5/16, 3/8, 7/16, 1/2, 5/8, 3/4	5 1/4	15.00	1-AB-4
2-AB-1	1/2, 5/8, 3/4, 7/8, 1	11 1/2	15.00	2-AB-1
2-AB-2	1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1	13 1/2	20.00	2-AB-2
2-AB-3	1/4, 5/16, 3/8, 7/16, 1/2, 5/8, 3/4	13 1/2	20.00	2-AB-3
2-AB-4	1/2, 5/8, 3/4, 7/8, 1, 1 1/8, 1 1/4	13 1/2	20.00	2-AB-4
2-AB-5	1/4, 5/16, 3/8, 7/16, 1/2, 5/8, 3/4, 7/8, 1	15 1/2	24.50	2-AB-5
2-AB-6	1/4, 5/16, 3/8, 7/16, 1/2, 5/8, 3/4, 7/8, 1, 1 1/8, 1 1/4	17	30.00	2-AB-6
3-AB-1	1, 1 1/4, 1 1/2, 1 3/4, 2	33	33.00	3-AB-1
3-AB-2	1, 1 1/8, 1 1/4, 1 1/2, 1 3/4, 2	37	38.00	3-AB-2

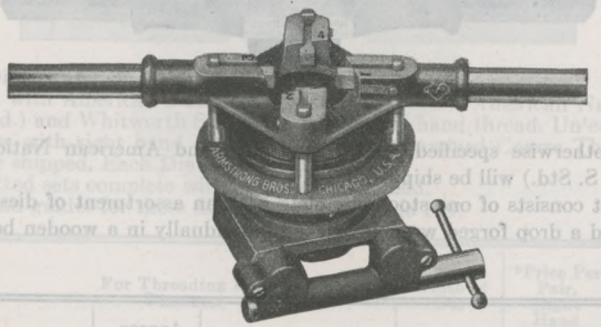
For extra Guides, see page 199.
For list of Standard Bolt Threads, see page 202.

"ARMSTRONG BROS." RECEDING THREADER No. 1

Cadmium Finish

This Improved Threader operates on the "receding die" basic principle and cuts perfect threads of 1″ to 2″ sizes with a minimum of effort. The Body is Certified Malleable Iron. The Handles are polished all over. For greater convenience and rapidity of adjustment we recommend that this Threader be ordered with our new improved self-centering pipe holder.

"Armstrong Bros." Chasers are made of Special Vanadium Tool Steel and are carefully hardened, drawn, tempered and tested. For complete description, see page 207.



Each Threader is furnished complete in a wooden box including four sets of Chasers for threading 1″, 1¼″, 1½″ and 2″ pipe and with either ring guides or self-centering pipe holder. Right hand American National Standard (Briggs) Chasers will always be sent unless otherwise ordered.

Be sure to specify whether ring guides or improved self-centering pipe-holder is wanted.

No.	For Threading Pipe, Size	Approx. Weight Complete, Pounds	Extra Handles, Per Pair	Ring Guides, Each	Extra Chasers, Per Size	Price Complete	
						With Ring Guides	With Pipe Holder
1	1, 1¼, 1½, 2	26	$2.50	$0.50	$2.50	$24.00	$30.00

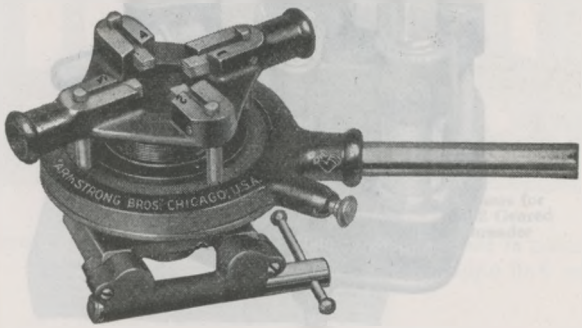
"ARMSTRONG BROS." RECEDING RATCHET THREADER No. 1-A

Cadmium Finished

This Threader is equipped with a reversible Ratchet and will thread 1" to 2" pipe with speed and precision in confined or difficult positions. The Ratchet will rotate the stock when the working arc is limited to only 10 degrees.

When conditions do not require the Ratchet, this Threader may be used as a two handled stock similar to the No. 1 Threader described on page 204 and to which it is similar in other respects. Extra handle for this purpose is included.

"Armstrong Bros." Chasers are made of Special Vanadium Tool Steel and are carefully hardened, drawn, tempered and tested. For a complete description, see page 207.



Each Threader is furnished complete in a wooden box including four sets of Chasers for threading 1", 1¼" 1½" and 2" pipe and with either ring guides or self-centering pipe holder. Right hand American National Standard (Briggs) Chasers will always be sent unless otherwise ordered.

Be sure to specify whether ring guides or improved self-centering pipe-holder is wanted.

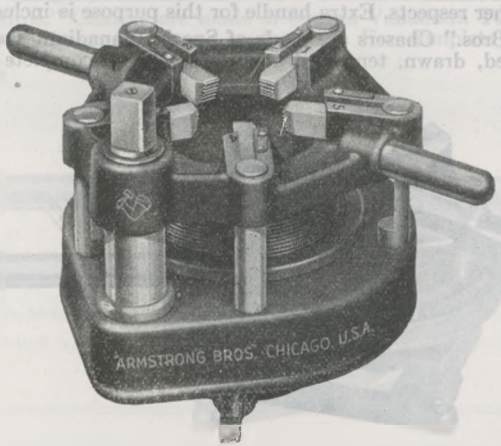
No.	For Threading Pipe, Size	Approx. Weight Complete, Pounds	Extra Handles, Per Pair	Ring Guides, Each	Extra Chasers, Per Size	Price Complete	
						With Ring Guides	With Pipe Holder
1-A	1, 1¼, 1½, 2	30	$2.50	$0.50	$2.50	$30.00	$37.50

"ARMSTRONG BROS." GEARED RECEDING THREADER No. 2

Cadmium Finish

This Threader operates through reduction gears which enable one man to thread 2½" to 4" pipe with ease. The Body is Certified Malleable Iron.

"Armstrong Bros." Chasers are made of Special Vanadium Tool Steel and are carefully hardened, drawn, tempered and tested. For complete description, see page 207.



Each Threader is furnished complete in a wooden box including 30" drop forged all steel ratchet handle*, guides, set screw wrench and four sets of Chasers for threading 2½", 3", 3½" and 4" pipe. Right Hand American National Standard (Briggs) Chasers will always be sent unless otherwise ordered.

No.	For Threading Pipe Size	Approx. Weight Complete, Pounds	Extra Ratchet Handle, Complete	Extra Lifting Handles, Each	Extra Set Screws, Each	Extra Guides, Each	Extra Chasers, Per Size	Price, Threader Complete
2	2½, 3, 3½, 4	95	$7.00	$1.25	$0.20	$1.80	$8.00	$100.00

*Shipped separately.

"ARMSTRONG BROS." CHASERS

For Receding Type Pipe Threaders

These Chasers are made of Special Vanadium Tool Steel. The cutting teeth are carefully hobbed and "backed off" for clearance. Each die segment is plainly marked with cutting size and number.

Hardened, drawn, tempered and tested, our Chasers are extra free cutting and accurate in every respect. They are standard in outside dimensions and will fit all makes of stocks intended for this type of die.

Chasers for Nos. 1 and 1-A Threaders

Chasers for No. 2 Geared Threader

Each set of Chasers is furnished complete in a wire clip. Unless otherwise ordered, Right Hand American National Standard (Briggs) Chasers will always be sent.

For list and description of No. 1 and No. 1-A Threaders, see pages 204-205; No. 2 Threader is described on page 206.

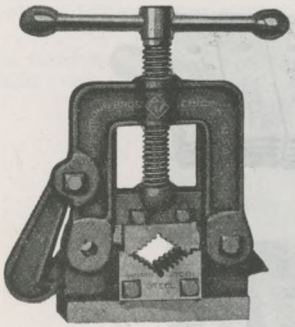
For Threader (Stock No.)	For Threading Pipe Size	Approx. Weight Per Set, Pounds	Price Chasers Per Size	For Threader (Stock) No.
1 & 1-A	1, 1¼, 1½, 2	⅜	$2.50	1 & 1-A
2	2½, 3, 3½, 4	2½	8.00	2

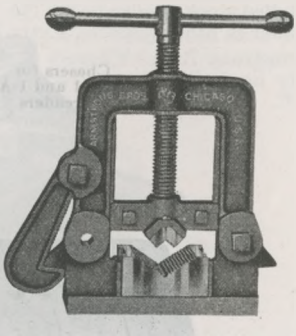
NOTE—High Speed Steel Chasers can be furnished. Prices on application.

"ARMSTRONG BROS." STANDARD PIPE VISES

Cadmium Finish

These Vises are of improved design and superior workmanship. They are automatic locking and combine convenient weight with strength and quick action. The frame and base are made of certified malleable iron. The jaws are tool steel carefully milled, hardened, tempered and tested. The hooks are drop forged of steel.





The illustration at the right shows the Full Length Jaws now furnished on Nos. 70 and 71 Vises. Full support for small size pipe.

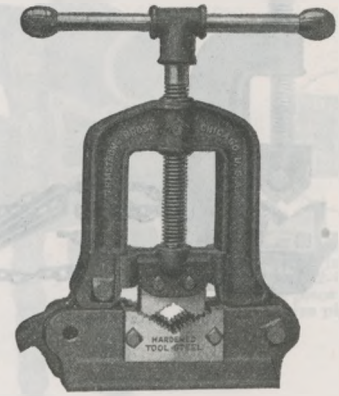
No.	Holds Pipe	Approx. Weight, Pounds	Extra Jaws, Per Set	Price Each, Complete	No.
7000	⅛ to 1¼	3	$1.20	$ 2.50	7000
700	⅛ to 1½	5	1.40	3.60	700
70*	⅛ to 2	7½	1.75	4.25	70
71*	⅛ to 2½	10	1.75	5.00	71
72	⅛ to 3½	16	2.50	7.50	72
73	⅛ to 4½	25	3.50	11.00	73
74	⅛ to 6	49	6.00	23.50	74
75	1 to 8	81	8.55	47.50	75

*With full length Jaws.

"ARMSTRONG BROS." HEAVY DUTY PIPE VISE

Cadmium Finish

This Vise has been carefully designed for use under conditions which require exceptional strength and stiffness. The frame and base are certified malleable iron; screw and handle are steel. The jaws are tool steel with milled teeth, and are carefully heat treated, oil tempered and tested.

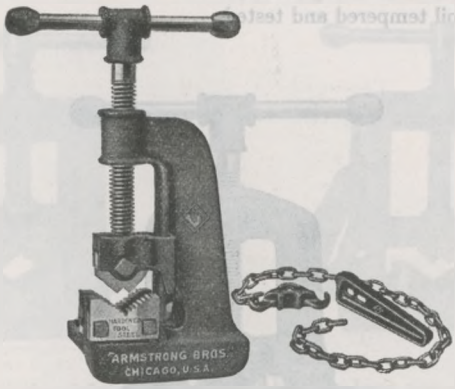


No.	Holds Pipe Size	Approx. Weight Each, Pounds	Extra Jaws, Set of Three	Price Each, Complete	No.
21	⅛ to 2½	16	$1.75	$ 8.00	21
22	⅛ to 3½	29	2.50	14.00	22
23	¼ to 5	42	3.50	20.00	23
24	½ to 7	76	8.00	35.00	24

"ARMSTRONG BROS." POST PIPE VISE

Cadmium Finish

Within its range this Vise combines all the desirable features, strength, quick action, convenience of operation and solid gripping power. The body is certified malleable iron. Screw and handle are steel. The jaws are tool steel with milled teeth and are carefully heat treated, oil tempered and tested.



Chain Attachment

By means of the chain attachment, this Vise can be solidly fastened to any post, telephone pole, tree or like support. The steel proof-tested chain passes through the body of the Vise eliminating the use of hooks or lugs where the strain is greatest. The wedge is certified malleable iron.

Unless otherwise specified, each Vise will be furnished with chain attachment, complete.

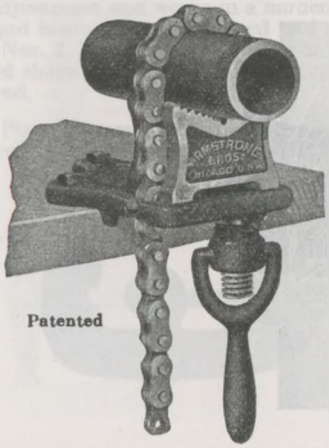
No.	Holds Pipe Size	Approx. Weight Each, Pounds	Extra Jaws Set of Three	Chain Attachment Only	Vise Only	Price Vise With Chain Attachment
10	⅛ to 2	12¾	$1.75	$3.50	$6.00	$9.50

"ARMSTRONG BROS." CHAIN PIPE VISE

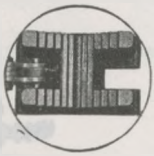
Drop Forged Steel — Hardened Jaws
Cadmium Finish

This Vise is extremely compact, convenient and quick in action. It combines maximum strength and capacity with minimum weight and is especially well adapted for use on outside jobs as it can very handily be carried in tool bag or chest and is easily attached to either post or bench.

The jaws of number 1-C and 2-C are drop forged in one piece. This design not only is the most solid construction but also gives a full support between the jaws for holding small size pipe. These important features are found only on the "Armstrong Bros." Chain Vise.



Patented



Above illustration shows the one-piece jaws of numbers 1-C and 2-C. Drop forged in one piece; full support for small size pipe.

Screws will be sent with chains unless "chain only" is specified.

No.	Holds Pipe Size	Approx. Weight, Pounds	Jaws, Pair	Chain with Screw	Screw Only	Handle with Nut	Nut Only	Price Each, Complete	No.
1-C	⅛ to 2*	4½	$ 3.00	$ 2.50	$ .80	$2.20	$1.40	$ 7.00	1-C
2-C	¼ to 4	12½	7.00	4.80	1.40	4.20	2.70	15.00	2-C
3-C	¼ to 6	18	12.00	9.00	2.50	7.00	4.00	27.00	3-C
4-C	¼ to 8	30	18.00	12.00	2.50	7.00	4.00	36.00	4-C

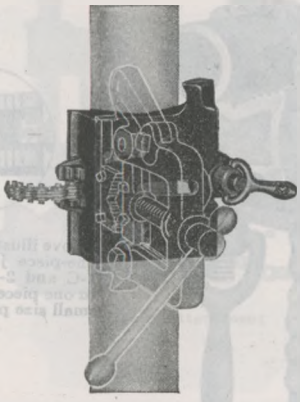
*Will grip pipe fittings having a diameter equal to diameter of 2½-inch pipe.

"ARMSTRONG BROS." PIPE VISE SADDLE

Cadmium Finish

This is a portable base for standard pipe vises that attaches instantly to round or square posts. Its wide range, handiness and sure grip on round steel posts as well as on wood posts of any shape make this a device long needed by plumbers, steamfitters and electricians.

The body is certified malleable iron and it is slotted to hold rigidly all standard make vises in the popular styles and sizes.* The tightening handle is drop forged and has a hardened steel nut; the flat link chain is proof-tested. Standard chain is 27 inches long and extra length chain can be furnished on specification.



Each Pipe Vise Saddle is furnished complete with bolts, nuts and washers for attaching vises, packed in a wooden box.

No.	Length Chain	Approx. Weight, Pounds	Price Each	No.
50	27	12	$6.00	50

The following "Armstrong Bros." Pipe Vises can be used with the No. 50 Pipe Vise Saddle:
Nos. 700, 70, 71, 72*....."Standard" Pattern described on page 208.
No. 21....."Heavy Duty" Pattern described on page 209.
No. 10....."Open Side" Post Vise described on page 210.
No. 1-C*, 2-C*....."Chain Vise" Pattern described on page 211.
*Special fitting required; no extra charge for fitting Pipe Vise Saddle when furnished with Vise.

"ARMSTRONG BROS."
COMBINATION PIPE CUTTER

A "One" or "Three" Wheel Pipe Cutter
Cadmium Finish

This Pipe Cutter can be used with one cutter wheel and two rollers, or with three cutter wheels.

The body, handle and swinging arm are certified malleable iron. Pins and rollers are tool steel, carefully machined, hardened and tempered. The feed rod is knurled for rapid adjustment and works in a hardened steel nut. The end of adjusting rod is hardened and bears upon a hardened tool steel block set in the swinging arm. The bottom of Nos. 2, 3 and 4 are tapped to take a pipe handle. The cutting wheels are of improved shape and are made from a special alloy tool steel, carefully hardened and tempered.

These Pipe Cutters are furnished assembled with two rollers and one cutter wheel. Price includes two extra cutter wheels.

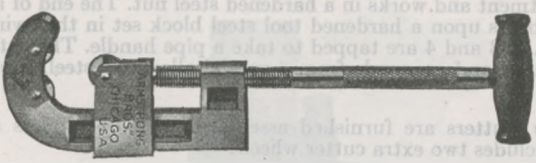
No.	Capacity	Approx. Weight, Pounds	Price Pins, Each	Price Rollers, Each	Price Wheels, Each	Price Complete Each	No.
1-A	⅛ to 1¼ Pipe	4	$0.10	$0.25	$0.70	$4.00	1-A
2-A	¾ to 2 Pipe	7¼	.15	.40	.80	6.00	2-A
3-A	1½ to 3 Pipe	12¾	.15	.40	.80	10.50	3-A
4-A	2½ to 4 Pipe	15½	.20	.60	1.10	19.00	4-A

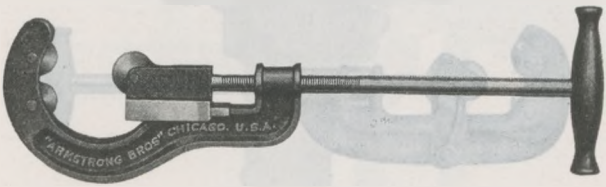
"ARMSTRONG BROS." 3-WHEEL PIPE CUTTERS

(Barnes Type)

Cadmium Finish

These Pipe Cutters are very convenient on general work and are indispensable when cutting under conditions where the cutter cannot be revolved entirely around the pipe. The body is certified malleable iron. Pins are tool steel carefully hardened. The cutter wheels are made from a special alloy tool steel; they are carefully hardened and heat treated to insure maximum strength and efficiency. Parts are interchangeable with similar parts of other standard makes.





Cutter No.	Capacity	Approx. Weight, Pounds	Price Pins, Doz.	Price Wheels, Each	Price, Complete	No.
1-B	⅛ to 1 Pipe	3	$1.00	$0.50	$4.50	1-B
2-B	½ to 2 Pipe	5¼	1.00	.60	6.00	2-B
3-B	1½ to 3 Pipe	8	1.00	.80	10.00	3-B
4-B	2½ to 4 Pipe	12	2.00	1.00	20.00	4-B
5-B	4 to 6 Pipe	20	2.00	1.10	30.00	5-B

"ARMSTRONG BROS." STANDARD PIPE CUTTER

(Saunders Type)—Cadmium Finish

This Pipe Cutter can be used to advantage wherever working conditions permit of revolving the cutter entirely around the pipe; only one cutter wheel is used and the action of the two hardened rollers eliminates almost entirely the burr raised by the cutter wheel. Screw bears on hardened tool steel insert. The point of the screw is hardened. Parts are interchangeable with similar parts of other standard makes.

No.	Capacity	Approx. Weight, Pounds	Price Pins, Each	Price Rollers, Each	Price Wheels, Each	Price Complete Each	No.
1-S	⅛ to 1 Pipe	3	$0.10	$0.24	$0.50	$3.00	1-S
2-S	1 to 2 Pipe	6	.10	.32	.60	4.50	2-S
3-S	2 to 3 Pipe	11½	.15	.50	1.10	7.50	3-S
4-S	2½ to 4 Pipe	15	.15	.50	1.10	15.00	4-S
5-S	4 to 6 Pipe	23	.15	.50	1.10	22.50	5-S

"ARMSTRONG BROS." TUBE CUTTER NO. 10

For clean, square cuts on brass, copper and lead tubing in all sizes from 3/16 to ¾ O. D., this Tube Cutter and Reamer is indispensable.

Price, No. 10 TUBE CUTTER, complete..... $2.00 Each
Extra Ground Cutter Wheels..... .40 Each
Extra Pins..... 1.00 Doz.

"ARMSTRONG BROS." DROP FORGED PIPE CUTTER

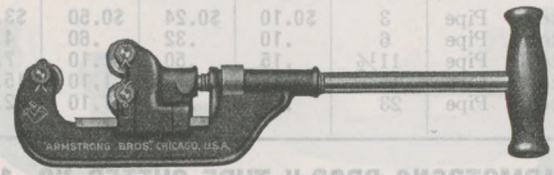
Cadmium Finish

This Pipe Cutter can be used with one cutter wheel and two rollers, or with three cutter wheels. The body is drop forged one piece construction. The handle is polished and the screw runs through a case hardened nut which can easily be replaced after long service.

Pins and rollers are made of Tool Steel carefully machined and hardened. The cutter wheels are of improved shape, made from a special Alloy Tool Steel and are hardened and heat treated.

These Pipe Cutters are furnished with two rollers and one cutter wheel unless otherwise ordered.

Parts are interchangeable with similar parts of other standard makes.



No.	Capacity	Approx. Weight, Pounds	Price Nuts, Each	Price Rollers, Each	Price Pins with Cotter Pins Dozen	Price Wheels, Each	Price Complete	No.
1-T	⅛ to 1¼ Pipe	5¾	$0.35	$0.25	$1.00	$0.60	$5.00	1-T
2-T	¼ to 2 Pipe	6¼	.35	.25	1.00	.60	6.00	2-T
3-T	1 to 3 Pipe	10½	.40	.50	1.00	.90	10.00	3-T

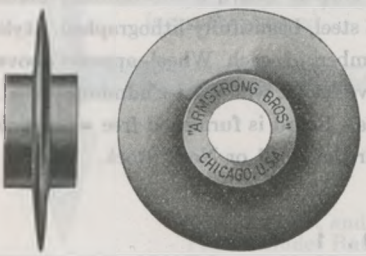
"ARMSTRONG BROS." KNIFE BLADE CUTTER WHEELS

Fitting Standard Pipe Cutters

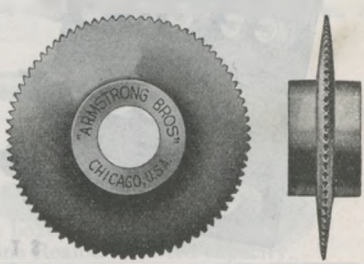
Cadmium Finish

Our Cutter Wheels are made from selected Alloy Tool Steel accurately machined, heat treated, hardened and oil tempered.

They hold their sharp cutting edge, cut very much faster and cleaner and require less power than is the case with the ordinary imperfectly designed wheel made from common steel.



Smooth Edge



Knurled Edge

ALLOY TOOL STEEL

Type of Pipe Cutter	No. 1 Price Each Smooth or Knurled Edge	No. 2 Price Each Smooth or Knurled Edge	No. 3 Price Each Smooth or Knurled Edge	No. 4 Price Each Smooth or Knurled Edge	No. 5 Price Each Smooth or Knurled Edge
Saunders	$0.50	$0.60	$1.10	$1.10	$1.10
Barnes	.50	.60	.80	1.00	1.10
Nye	.70	.80			
Trimo	.60	.60	.90		
Armstrong Bros. (Combination)	.70	.80	.80	1.10	
Armstrong Bros. 3-Wheel	.50	.60	.80	1.00	1.10
Armstrong Bros. Standard	.50	.60	1.10	1.10	1.10
Armstrong Bros. Drop Forged	.60	.60	.90		

Old style thick wheels can be furnished when desired.
No. 5 wheels for Barnes type Cutters also fit No. 6 and No. 7 Barnes type Cutters.

"AUTOMATIC SALESMAN" Nos. 1 AND 2 PIPE CUTTER WHEEL STOCKS AND DISPLAY BOARD

These Stocks include Armstrong Bros. knife blade Cadmium finished pipe cutter wheels for all standard make pipe cutters. Both knurled and smooth edge cutter wheels are included, as listed below.

The Display Board is substantially made of sheet steel, beautifully lithographed. Style and number of each Wheel appears above respective hooks, which are Cadmium plated. A Display Board is furnished free with each order for the No. 1 or No. 2 stock.

STOCK NO. 1

Cutter Wheels: Smooth, Each	Cutter Wheels: Knurled, Each	For Pipe Cutters, No.	Price Each
For Saunders Type Pipe Cutters			
6	6	1-S	$0.50
6	6	2-S	.60
4	4	3-S	1.10
For Trimo Type Pipe Cutters			
4	4	1-T	$0.60
4	4	2-T	.60
4	4	3-T	.90
For Barnes Type Pipe Cutters			
6	6	1-B	$0.50
6	6	2-B	.60
6	6	3-B	.80
4	4	4-B	1.00
For Armstrong Bros. Heavy Duty Pipe Cutters			
6	6	1-A	$0.70
4	4	2-A or 3-A	.80

Price, Stock No. 1—Armstrong Bros. Pipe Cutter Wheel Stock and Display as listed and described above, 120 Cutter Wheels. Approx. weight 10 lbs.
Price..... $84.40

Price, Stock No. 2—Armstrong Bros. Pipe Cutter Wheel Stock and Display as listed and described above, except with one-half the number of Cutter Wheels (3 wheels where there are 6 in the No. 1 Stock and 2 where there are 4) 60 Cutter Wheels. Approx. weight 6 lbs.
Price..... $42.20

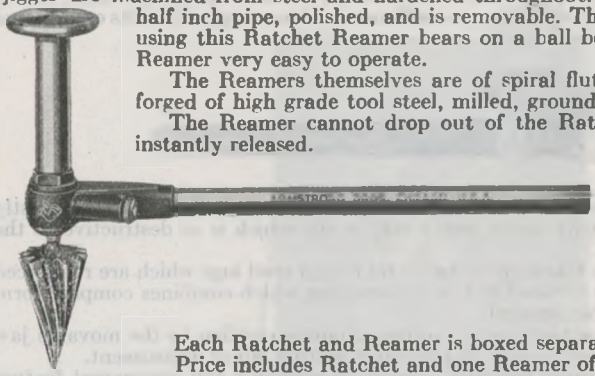
"ARMSTRONG BROS." RATCHET PIPE REAMER

Drop-Forged, Ball Bearing Action

Cadmium Finish

This a high grade general service Ratchet Reamer for removing burrs caused by cutting pipe.

The Ratchet is drop forged of steel, while the spindle, gear, nut and reversing jigger are machined from steel and hardened throughout. The handle is standard half inch pipe, polished, and is removable. The applied pressure when using this Ratchet Reamer bears on a ball bearing which makes this Reamer very easy to operate.



The Reamers themselves are of spiral fluted design and are drop forged of high grade tool steel, milled, ground and hardened.

The Reamer cannot drop out of the Ratchet socket, yet can be instantly released.

Each Ratchet and Reamer is boxed separately.
Price includes Ratchet and one Reamer of listed capacity.

No.	Capacity Pipe	Approx. Extreme Length	Weight, Pounds	Price, Extra Ratchets	Price, Complete	No.
122	⅛ to 1	18	4½	$7.50	$8.75	122
122½	¼ to 1¼	18	4¾	7.50	9.00	122½
124	¼ to 2	18	5½	7.50	10.50	124

EXTRA REAMERS

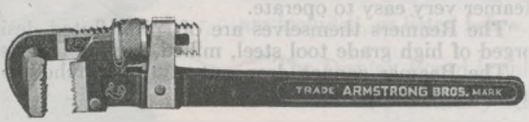
No.	Capacity Pipe	Style of Shank	Approx. Weight, Pounds	Price, Each	No.
42	⅛—1	Bit Brace	¼	$1.25	42
42½	¼—1¼	Bit Brace	½	1.50	42½
44	¼—2	Bit Brace	1¼	3.00	44

"ARMSTRONG BROS." PIPE WRENCH

Drop Forged — All Steel

Cadmium Finish

When your hand grips an "Armstrong Bros." Pipe Wrench it thrills to the feel of the perfect balance resulting from correct design and accurate proportions, and as you continue to use it day after day you will more and more appreciate its exceptional strength, simplicity and efficiency.



The patented "ball and socket" nut gives increased flexibility and vastly greater strength, especially under heavy side strain, which is so destructive to the ordinary wrench frame.

Side Pull Strain is taken up by two solid forged steel lugs which are reinforced or tied together by the recessed nut, a construction which combines compact form with the greatest possible strength.

The novel spring action insures proper gripping position to the movable jaw and imparts just sufficient tension to prevent it getting out of adjustment.

Adjusting Nut cannot fall out. This is an exclusive and convenient feature which will be appreciated by pipe fitters who have had to hunt for the "fixins" after taking the jaw out of the old style wrenches.

The Handle does not act inside a frame and is therefore, not restricted in size, but is so designed as to be strongest at the point of greatest strain and there is no projecting part below line of handle.

The inserted lower jaw is of select tool steel and properly hardened to give long life to the teeth. The handle and the movable jaw are drop forged alloy steel.

All parts are absolutely self-cleaning in action, with no chance to clog or gum up.

Lgth.	Capacity	Approx. Weight	Handles	Yoke	Jaw or Yoke Pins	Nut	Spring Assembly	Insert Jaw	Movable Jaw	Price Each
6 in.	⅛ to ½ in.	½ lb.	$1.10	$0.15	$0.03	$0.25	$0.05	$0.50	$0.65	$1.90
8 in.	⅛ to ¾ in.	¾ lb.	1.25	.15	.03	.25	.05	.55	.70	2.20
10 in.	⅛ to 1 in.	1½ lb.	1.75	.20	.04	.30	.06	.65	1.10	2.85
14 in.	¼ to 1½ in.	2¾ lb.	2.45	.35	.04	.45	.07	.85	1.50	3.85
18 in.	¼ to 2 in.	4½ lb.	3.50	.55	.04	.60	.08	.95	2.15	5.50
24 in.	¼ to 2½ in.	7½ lb.	5.65	.80	.04	.80	.10	1.10	3.50	9.50
36 in.	¼ to 3½ in.	15¼ lb.	11.50	1.10	.05	1.40	.12	1.50	5.70	20.00

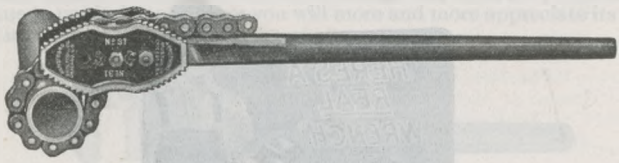
"ARMSTRONG BROS." PIPE WRENCH COUNTER DISPLAY

This very attractive Pipe Wrench display is not only most well made but is one that actually sells pipe wrenches. It is made of heavy gauge metal, lithographed in five colors. The substantial wire easel is constructed so that there is no chance of the display tipping over. It is arranged to hold a 14" wrench. This display will be furnished free on request with any dealer's stock order for Armstrong Bros. Pipe Wrenches.

"ARMSTRONG BROS." CHAIN PIPE TONGS

With Double Ended Reversible Jaws

The ARMSTRONG BROS. Reversible-Jaw Pipe Tongs have double ended jaws which may be quickly changed, end for end, if the teeth become burred or dull from long use. This feature gives double life—the service of *"two tools for the price of one."*



THE JAWS are Drop Forged from special high carbon steel, carefully milled, heat treated, hardened and tested for toughness and lasting qualities.

THE HANDLES are forged from spring steel selected to give the required stiffness.

THE CHAINS are Proof-Tested. Attached to each is a leaden seal—evidence of proven strength. This seal, bearing the "ARMSTRONG BROS." Trade Mark, indicates that the chain has been tested to ⅔ of catalog strength (From 1,200 lb. to 40,000 lb.).

With "ARMSTRONG BROS." Pipe Tongs you are certain of strength beyond your greatest needs—a proved safety factor on which you can rely in any emergency.

WITH FLAT LINK CHAINS ONLY

Number	30	31	32	33	33½	34	35	*16
***For Pipe,** size, in....	⅛ to ¾	⅛ to 1½	¼ to 2½	¾ to 4	1 to 6	1½ to 8	2 to 12	4 to 18
Approx. Length.....	13¾	20	27	37	44½	50½	64½	87
Approx. weight, lbs...	1¾	5¾	10	16	24	31	50	137
Flat Chain, length....	9½	13½	17½	22½	32	40½	55½	74½
Breaking strain, lbs.	3,600	6,700	9,800	12,500	14,300	15,700	21,800	40,000
Price, Complete.....	$ 5.00	$ 7.00	$10.00	$14.00	$18.00	$22.00	$36.00	$80.00
Extra Chain.....	1.50	2.00	3.00	5.00	7.00	9.00	15.00	40.00
Extra Jaws, pair....	2.00	3.50	5.50	8.00	9.50	11.00	15.00	32.00
Extra Nuts and Studs for Jaws, per set...	.40	.50	.70	.90	1.10	1.40	1.80	.....

*Wrenches for pipe sizes larger than 12 inches are supplied only in the non-reversible jaw form. See page 223.

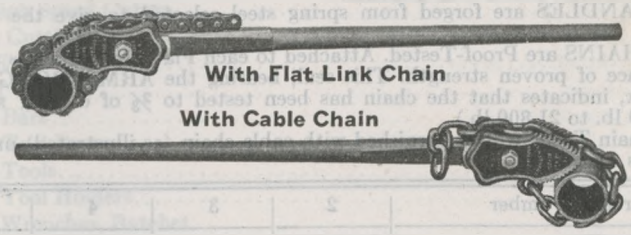
"ARMSTRONG BROS." CHAIN PIPE TONGS

Improved Design

The Chain Pipe Wrench is so designed as to embody the best features of its type and also to eliminate some of the weak points which extensive use and exhaustive tests have developed in other makes.

By means of the greatly increased bearing of jaw sockets upon the bar, combined with the extra large hardened Steel bolt, the jaws are held solidly in place under the most severe use.

The bolt is extra large and the shackle or connecting link is drop forged from Chrome-Nickel Steel.



The **Handles** are forged from high carbon steel and have the stiffness and "spring" needed to stand up under hard service.

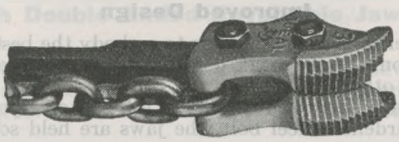
The **Jaws** are drop forged from special steel, treated, hardened and tested for toughness and lasting qualities.

The **Chains** are best quality and each flat link chain is Proof-Tested to two-thirds of catalog strength. To each chain after it is proof-tested is attached a leaden seal bearing our trade mark. Every wrench bearing this seal has an established safety-factor on which the user can rely. Flat link chains will be shipped unless otherwise specified.

Wrench Number	10	11	12	13	13½	14	15	16
CAPACITY:								
Size Pipe	⅛ to ¾	⅛ to 1½	¼ to 2½	¾ to 4	1 to 6	1½ to 8	2 to 12	4 to 18
Approx. length	14	20	27	37	44	51	65	87
Approx. weight, lbs.	1¾	6	10	16½	23	32	53	137
FLAT LINK CHAIN:								
Length	9½	13½	17½	22½	32	40½	55½	74½
Breaking Strain, lbs	3,600	6,700	9,800	12,500	14,300	15,700	21,800	40,000
CABLE CHAIN:								
Length	9¾	14½	18	27	33½	42	57	76
Breaking Strain, lbs	1,200	4,000	6,000	10,500	12,500	15,000	19,000	40,000
PRICE:								
Complete Wrench	$ 5.00	$ 7.00	$10.00	$14.00	$18.00	$22.00	$36.00	$80.00
Extra Chain	1.50	2.00	3.00	5.00	7.00	9.00	15.00	40.00
Extra Jaws, Pair	2.00	3.50	5.50	8.00	9.50	11.00	15.00	32.00
Extra Bolt and Nut, per Set	.28	.36	.46	.60	.70	.90	1.30	2.50

IDEAL CHAIN TONGS

For Pipe, Fittings and Flanges



THE JAWS have straight teeth for pipe and V shaped teeth for fittings. Drop Forged from special high carbon steel carefully milled, heat treated, hardened and tested for toughness and lasting qualities.

THE HANDLES are forged from spring steel selected to give the required stiffness.

THE CHAINS are Proof-Tested. Attached to each Flat Link Chain is a leaden seal—evidence of proven strength. This seal, bearing the ARMSTRONG BROS. Trade Mark, indicates that the chain has been tested to ⅔ of catalog strength. (From 9,800 lb. to 21,800 lb.).

Ideal Chain Tongs will be furnished with cable chain (as illustrated) unless flat link chain is specified.

Wrench Number	2	3	4	5
Capacity: Size Pipe	½ to 3½"	1 to 5	1 to 8	2 to 12
Size Fittings	½ to 3	1 to 4	1 to 6	2 to 10
Approx. Length	27	38	49	61
Approx. Weight, Lbs	10	18	27	52
Flat Link Chain: Length, Inches	17½	22½	32	50
Breaking Strain, Lbs	9,800	12,500	14,300	21,800
Cable Chain: Length, Inches	21	28	36	51
Breaking Strain, Lbs	9,000	12,500	14,300	21,800
Price: Complete Wrench	$10.00	$14.00	$18.00	$36.00
Extra Chain	3.00	5.00	7.00	15.00
*Extra Jaws, Pair	5.00	8.00	9.50	15.00
Extra Studs and Nuts, per set	.70	.90	1.10	1.80
Extra Pins, Each	.15	.20	.25	.35

*If single jaw only is wanted, specify right or left.

IDEAL FLANGE LINK

Works right or left—from either side.

The Ideal Flange Link consists of a special cast steel link and pin. It is readily attached to the Ideal Chain Wrench in place of the chain.

For Wrench, Number	2	3	4	5
Capacity, Size Flange	1 to 4	2 to 6	2 to 8	4½ to 16*
Price, Flange Link	$6.00	$8.00	$10.00	$19.00
Price, Extra Pins	.80	.90	1.00	1.10

*4½ to 20 and 4½ to 24 sizes for No. 5 Wrench also available.

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